installation and
reference guide

hp surestore
fc switch 6164

www.hp.com

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Part number: A7326-90902
Edition: E0801

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Format conventions

variable	Indicates that you must supply a value.
`output`	Denotes text displayed on the screen.
[ ]	Indicates that the enclosed element is optional and may be left out.
{ }	Indicates that you must specify one of the listed options.
|	Separates alternatives.
. . .	Indicates a repetition of the preceding parameter.

Tip Denotes ideas for enhanced product usage.

Note Denotes significant concepts or operating instructions.

CAUTION Denotes a hazard that can cause hardware or software damage.

WARNING Denotes a hazard that can cause personal injury or death.

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Revision History

July 2001	First release.

PREFACE

About This Guide

This document provides both hardware and software information to support the HP Surestore FC Switch 6164, and is organized as follows:

Chapter 1 Introducing the FC 6164	Provides general information about the FC 6164 and an overview of the installation procedure.
Chapter 2 Installing and Configuring the FC 6164	Provides information about installing and configuring the FC 6164.
Chapter 3 Mechanical Specifications	Provides the mechanical details of the FC 6164.
Chapter 4 Diagnostics	Provides information about diagnostic tests and error messages.
Chapter 5 Maintenance Procedures	Provides maintenance procedures for the FC 6164.
Chapter 6 Introducing Fabric Manager	Provides an overview of Fabric Manager, the management software provided with the FC 6164.
Chapter 7 Installing Fabric Manager	Provides system requirements and instructions for installing and launching Fabric Manager.

Chapter 8 Using Fabric Manager	Provides information about each of the screens available through Fabric Manager.
Chapter 9 Telnet Commands	Provides information about the Telnet commands that are specific to administration of the FC 6164.

Related Publications

Related product information can be found in the following publications. Those publications with part numbers are provided as printed copies with your product. The HP Surestore FC Switch 6164 Documentation CD contains all publications listed in the table below and is also provided with your product.

Title	Part Number
HP Surestore FC Switch 6164 Documentation CD	A7326-11011
HP Surestore FC Switch 6164 Installation and Reference Guide	A7326-90902
HP Surestore FC Switch 6164 Quick Start Guide	A7326-90901
Distributed Fabrics User's Guide, version 2.2	Available only on CD
Fabric OS Reference Manual, version 2.4	Available only on CD
Fabric Watch User's Guide, version 2.2	Available only on CD
MIB Reference Manual, version 2.3	Available only on CD
QuickLoop User's Guide, version 2.3	Available only on CD
Web Tools User's Guide, version 2.3	Available only on CD
Zoning User's Guide, version 2.2	Available only on CD

For information about Fibre Channel standards, visit the Fibre Channel Association web site, located at

http://www.fibrechannel.com.

Getting Help

For support information, visit the HP web site located at:

http://www.hp.com

Getting Software Updates

Firmware and software updates are found on the HP web site at:

http://www.hp.com

New switch firmware can be installed from the following host operating systems:

- UNIX
- Windows NT
- Windows 2000
- Windows 98
- Windows 95

1

INTRODUCING THE FC 6164

The HP Surestore FC Switch 6164 provides a 64-port enterprise-class fibre channel switching solution for any-to-any connectivity requirements in a Storage Area Network (SAN). The FC 6164 provides a cost-effective means of meeting the large-port-count requirements of workgroups and enterprises.

The FC 6164 is a rack-mountable solution, comprised of a chassis and six fully integrated switch modules, with preconfigured inter-switch link (ISL) fiber optic cables and enhanced management software. The FC 6164 includes Fabric Manager, a management application that provides a centralized view of the integrated switch modules to simplify administration and maintenance.

Using this preconfigured, stand-alone fabric as a building block of larger fabrics, you can scale your storage environment as needed while leveraging your existing server and storage infrastructure.

Management Tools

You can manage the FC 6164 at the fabric level and at the switch level.

Fabric-level Management Tool

- Fabric Manager

  Fabric Manager provides a centralized, high-level fabric view of the FC 6164, and all other switches if connected in a larger SAN, allowing for easy administration of the fabric. When more detailed information is requested, Fabric Manager interacts seamlessly with Web Tools to provide switch-level information.

  Fabric Manager is included with the FC 6164 product, and is installed on a workstation computer, instead of on the switch, thereby using less switch resources. The workstation computer must be on the same network as the switches being managed.

Switch-level Management Tools

The following software is installed on each of the six switches in the integrated fabric:

- Fabric Operating System (OS) v2.4
- Full Fabric (E_Port)
- Fabric Watch Profile
- QuickLoop – The FC 6164 is shipped with all ports defaulted to fabric mode.
- Web License
- Zoning License
- Enterprise Bundle:
  - Zoning
  - Web Tools
  - Fabric Watch

2

MECHANICAL SPECIFICATIONS

The FC 6164 is a plug-and-play fabric that provides 64 user ports, and is comprised of the following items:

- a chassis with a removable front door
- six FC Silkworm 2250 switches (Each 2250 switch has one serial port and one Ethernet port)
- one serial cable
- six power cables
- all required ISL (inter-switch link) fiber optic cables and ISL GBICs

Chassis-level Information

The FC 6164 chassis includes cable-routing holes in the upper, lower, and side panels for easy cable management.

A color-coded ISL cable diagram is provided on the inside bottom of the chassis, for reference when switches or ISL cables are being replaced (see Chapter 4, “Maintenance Procedures”, for the cable and switch replacement procedures). Each port should be connected by the ISL cable to the other

port that has the same color in the diagram. This color should also match the label color on the associated ISL cable.

Weight Specifications

Table 1. Weight Specifications

Hardware	Weight
Chassis (empty)	~ 65 Pounds
Individual 2250 switch	~ 20 Pounds
Chassis with all six switches installed (fully loaded with GBICs and fiber optic cables)	~ 200 Pounds

Dimensions

The FC 6164 chassis has the following dimensions:

Dimension	Size	Smallest Rack Space
Height	25 inches	14 Units
Width	19 inches	19 inches
Depth	24 inches	30 inches

The FC 6164 chassis has a 14 unit (25 inch) rack height, 19 inch rack width, and is 24 inch deep, fitting in a 30 inch deep rack.

Thermal Characteristics

Each of the six 2250 switches has built-in axial fans to cool the units. The direction of air flow is from the air inlet side to the service side (the front, where the ports and ISL cables are) of the units. The entire FC 6164 is optimized to provide proper cooling for a maximum power rating of 70 Watts per 2250 switch. Total system power is 420 Watts.

The FC 6164 has an operating range in 10 to 40°C at 3 km (9,800 feet).

GBICs

The FC 6164 is compatible with the following types of GBICs:

- short wave GBICs
- long wave GBICs
- short wave serial ID GBICs
- long wave serial ID GBICs
- smart GBICS (available from Finisar)

The FC 6164 product includes SWL (short wave length) GBICs for the ISL (inter-switch link) ports. GBICs for the user ports are not included.

Fiber Optic Cables

The FC 6164 product includes gray fiber optic cables for the ISL ports. Fiber optic cables for the user ports are not included.

Standard fiber optic cables can be used for the user ports, and connections can be made to the GBICs inserted in the user ports using standard dual SC plug connectors, as shown in Figure 1. The fiber optic connectors are keyed and must be inserted into the GBIC module connector in proper alignment.

CAUTION The fiber optic cables are fragile and should not be bent to a radius of less than 0.5 inches.

Do not force the fiber optic plug into the GBIC module because this can damage the connector, the GBIC module, or both. Verify that the fiber optic connector is clean, free of dust or debris, and correctly aligned before inserting the connector into the GBIC module.

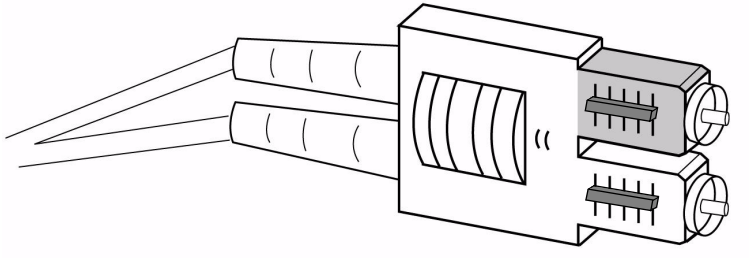


Figure 1. Dual SC Fiber Optic Plug Keyed Connector

The acceptable environmental ranges for the FC 6164 are shown in Table 2. These environmental ranges also apply to each switch.

Table 2. FC 6164 Environmental Specifications

Specification	Value
Temperature (operating)	10 to 40°C
Temperature (nonoperating)	-35 to 65°C
Operating humidity	5 to 85% noncondensing at 40°C
Nonoperating humidity	95% RH nonconducting at 40°C
Operating altitude	0 to 3 km above sea level
Nonoperating altitude	0 to 12 km above sea level
Operating shock	4 G, 11-MS duration, half sine
Nonoperating shock	20 G, 11-MS duration, sq.wave
Operating vibration	5 G, 0 to 3 kHz
Nonoperating vibration	10 G, 0 to 5 kHz

Switch-level Information

General Information About the 2250 Switch

The 2250 switch has full fabric capability, which allows the 2250 switch to be linked to multiple other fibre channel switches to build a scalable SAN fabric, capable of supporting large numbers of attached storage devices. The FC 6164 supports F_Port, FL_Port, and E_Port connections and a Distributed Name Server (DNS). There is no On/Off switch; the switch is powered on or off when the power cable is connected or disconnected.

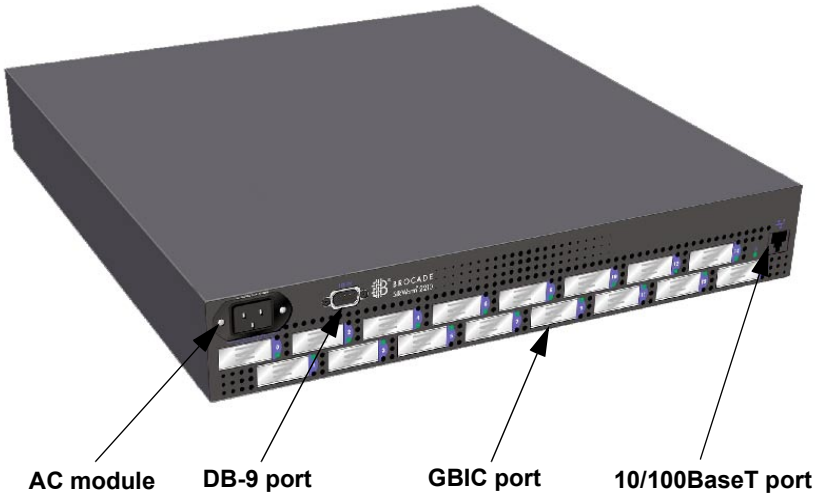


Figure 2. 2250 Switch

Switch Specifications

Table 3 lists general switch specifications for the 2250 switch.

Table 3. Switch Specifications

Specification	Description
Fabric initialization	Complies with FC-SW 3.2
IP over Fibre Channel (FC-IP)	Complies with FC-IP 2.3 of the FCA profile
System architecture	Nonblocking shared-memory switch
System processor	Superscalar 33-Mhz Intel i960RP
Number of Fibre Channel ports	16 GBIC ports
Fibre Channel port speed	1.0625-Gbps full duplex
Modes of operation	Fibre Channel Class 2 service and Fibre Channel Class 3 connectionless service
Aggregate switch I/O bandwidth	16 Gbps, full duplex
Frame buffers	16 buffers per port at 2112 bytes per frame
Port to port latency	Less than 2 microseconds with no contention
Data transmission range	Up to 500 m (1,625 ft.) for short wave length optical link Up to 10 km (32,820 ft.) for long wave length optical link
Chassis type	Back-to-front airflow (AC power connection out front)

2250 Switch Physical Dimensions

Table 4. 2250 Switch Physical Specifications

Rack Mount Dimensions:	1.5U, 19-in. rack mount (EIA compliant)
Weight:	20.0 lbs.

Switch Memory

The available memory for the FC 6164 is as follows:

- Main memory: 16 MB per switch
- Flash memory: 4 MB per bank, with 2 banks in the 2250 switch (mirrored for redundancy)

Power Supply

The 2250 switch is powered on when the power cable is connected to the switch and to a power source. The switch automatically performs a power on self test (POST), which is a diagnostic test that takes approximately 2 minutes.

The 2250 switch has a universal power supply capable of functioning worldwide without voltage jumpers or switches. The power supply module is autoranging in terms of accommodating input voltages and line frequencies.

Table 5. Power Supply Requirements

Total P/S power	70 to 120 W (70-W convection, without fan; 120-W with 30 CFM forced air, with fan)
Max. switch power	60 to 70W
Input voltage	85 to 264 VAC
Input line frequency	47 to 63 Hz
Harmonic distortion	Power factor correction per IEC61000-3-2
BTU rating	110 W x 3.412 BTU/hr/W = 375 BTU/hr

Environmental Specifications for each Switch

The acceptable environmental ranges for the 2250 switch are the same as for the entire FC 6164, and are listed under “Thermal Characteristics” on page 16.

LED Status Indicators

Each port, and the AC power connection, has an LED that indicates the status for that port or power connection. Table 6 provides a description of port and AC power status indicators and possible corrective actions in case of faulty status.

Table 6. LED Status Indicators

LED/Time Interval	Status/Description	Action
No light showing	No light or signal carrier (no module, no cable) for media interface LEDs.	Check media connection.
Steady yellow	Receiving light or signal carrier, but not yet online.	No action required.
Slow yellow (on for one second; off for one second)	Port is disabled (result of diagnostics or port disable command).	Reset at management station.
Fast yellow (on for 1/4 second; off for 1/4 second)	Error, fault with port.	Reset switch.
Steady green	Port is online but no traffic (connected with device over cable).	No action required.
Slow green (on for one second; off for one second)	Port is online but segmented (loopback cable or incompatible switch).	Check media connection at both ends.
Fast green (on for 1/4 second; (off for 1/4 second)	Internal loopback (diagnostic).	No action required.
Flickering green	Port is online with traffic flowing through port.	No action required.

Table 6. LED Status Indicators (continued)

LED/Time Interval	Status/Description	Action
Interleaving green and yellow	Port is bypassed.	Reset at management station.
AC Power LED	Status/Description	Action
No light showing	No power is being supplied to the switch.	Check power cord connection to the switch.
Steady green	Receiving power and switch is online.	No action required.

3

INSTALLING AND CONFIGURING THE FC 6164

This chapter provides instructions for installing and configuring the FC 6164.

Note For detailed information about any of the Fabric OS commands referenced in this chapter, enter `help` followed by the `[command name]` at the Telnet prompt. For example, to display information about the `fabricShow` command, enter the following: `help fabricShow`

Installation Considerations and Safety Guidelines

WARNING The FC 6164 weighs approximately 200 pounds. Use proper handling and lifting equipment, such as a hydraulic lift, to reduce the possibility of injury or product damage.

The FC 6164 is a high-port count integrated fabric comprised of six switch modules in a rack mountable chassis.

- If installing the FC 6164 in a closed or multi-rack assembly, ensure the air temperature measured inside the FC 6164 chassis door does not exceed 40°C during operation.
- Ensure the airflow available to the switch fabric is at least 300 cfm (cubic feet per minute).
- Verify that the fully-loaded chassis does not unbalance the rack or exceed the rack's mechanical limits, with all six FC 6164 switches secured in the chassis and with one switch partially extended out of the chassis.
- Verify the supply circuit, line fusing, and wire size are adequate according to the electrical rating on the switch nameplate.
- Verify that all equipment installed in the rack has a reliable branch circuit ground connection.
- It is strongly recommended that the EIA Rack be mechanically secured to prevent tipping over in an earthquake.

Procedures

Use the procedures in this section to upack, install, and configure a the FC 6164. The overall procedure of installing and configuring the FC 6164 involves the following secondary procedures, described on the indicated pages:

1. "Unpacking the FC 6164" on page 28
2. "Installing the FC 6164 in the Rack" on page 28
3. "Configuring the FC 6164" on page 51

Items Required

The following items must be available before you begin the installation procedures:

- FC 6164
- 30” deep rack space, 14 rack units high and 19” wide
- Six Ethernet cables, one for each switch
- Six power outlets, one for each switch
- FC 6164 worksheet, provided in Appendix A, “FC 6164 Worksheet”
- Serial cable connected to the workstation, long enough to connect to each of the switches in the chassis
- Workstation that has a terminal emulator application (such as HyperTerminal)
- Six unused IP addresses
- Ethernet connection between the workstation and the FC 6164 (such as through a hub)
- #2 Phillips screwdriver
- T20 Torx screwdriver
- Genie lift (to transport the switch) For information on the lift, see:

  http://www.genielift.com/ml-series/ml-1-2.html

  or

  http://slick2.atl.hp.com/ceworld/siteservices/tools/genie/genielift_ordering.htm

Unpacking the FC 6164

To unpack the FC 6164:

1. Open the shipping carton.
2. Remove all of the packaging materials.
3. Remove the screws holding the FC 6164 to the pallet.

Installing the FC 6164 in the Rack

This section provides the step-by-step procedure for installing the FC Switch 6164 in either an HP rack or a Compaq/Rittal 19-inch rack.

Note Most of the steps in this procedure are unnecessary if the FC 6164 was installed at an HP integration center prior to shipment. However, Steps 18 and 19 (assembling and installing the plenum) and Step 21 (installing the switch door) must be performed for factory-integrated switches (see pages 47 and 50).

Rackmount Safety Guidelines

In a rackmount installation, follow these safety guidelines:

- When installing a switch in a closed or multi-rack assembly, make certain the air temperature, measured at the front panel, does not exceed 40° C during operation.
- Ensure that the airflow available to the switch is at least 300 cfpm.
- Verify the supply circuit, line fusing, and wire size are adequate. Refer to the switch's nameplate for its power requirements.
- Verify that all equipment installed in the rack has a reliable ground connection. Do not rely on connection to a branch circuit, such as power strips.
- Route and support the power cord to ensure that it does not become crimped or damaged and to prevent it from interfering with other equipment and cabling installed in the rack.
- The FC 6164 weighs approximately 200 pounds. A lift is required to move and position the switch safely, and at least two people are required

to lift and position the switch onto the lift. Two or more people are also required to move the switch from the lift into the rack and when positioning the switch in the rack. Move the switch chassis slowly and carefully at all times, and continue supporting it until it is correctly positioned on the rail tray and fastened to the rack. Use extreme caution when handling or transporting the switch to prevent injury to personnel, damage to the switch, and/or damage to the rack and other equipment mounted in it.

Package Contents

Figure 3 shows the major items contained in the FC 6164 shipping carton(s). Table 7 lists the contents of the shipping carton.

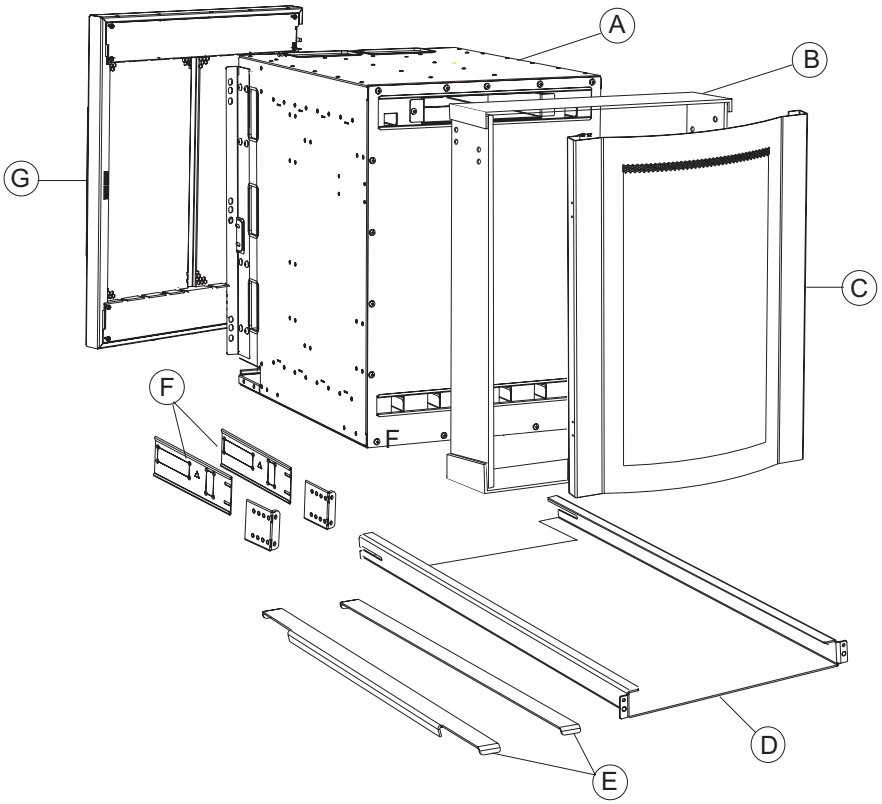


Figure 3. Major Items Contained in the Shipping Carton(s)

Table 7. Contents of the Shipping Carton(s)

A	Switch
B	Plenum kit (4 rectangular sheets of Lexan with 6 adhesive strips pre-attached) (HP P/N A7326-87903)
C	Front bezel (HP P/N A7326-40001)
D	Rail Tray kit (Rail tray, 2 brackets, 2 M5 Tinnerman nuts, 4 M5 Torx screws) (HP P/N A6534-60016)
E	Shim plates (2 ea. HP P/N A7326-87904)
F	Rack Mount Bracket set (2 Rack-Mount brackets) (HP P/N A7326-87901)
G	Switch door (part of Accessory kit [HP P/N A7326-70001], which also includes: Software CD, Documentation CD, and Serial cable)
H	Miscellaneous hardware: (not shown) (HP P/N A7326-87905) Note: The hardware in the Standard hardware package (unmarked plastic bag) is required to install the switch in an HP rack. Some of the hardware in the Standard hardware package and the hardware in the Compaq/Rittal hardware package is required to install the switch in a Compaq/Rittal rack. <u>Standard hardware package</u> 8 #8-32 x .375-inch (.3125) flat-head screws w/patchlock. 8 M5 Torx screws with lock washers 6 M5 Tinnerman nuts 4 1/4-20 x 1/2-inch Phillips pan-head screws with lock washers <u>Compaq/Rittal hardware package</u> 6 #10-32 Tinnerman nuts 6 #10-32 x 5/8-inch Phillips pan-head screws with captive lock washers 6 Spacers 4 1/4-inch flat washers 4 M5 flat washers

Note A package containing two mounting rails may be included with the switch. These rails are not used and can be discarded.

Hardware Identification

Figure 4 contains drawings and descriptions of the hardware used when installing the FC 6164 in an HP rack or a Compaq/Rittal rack. Use this key to help identify the hardware specified in the installation procedure in this chapter.

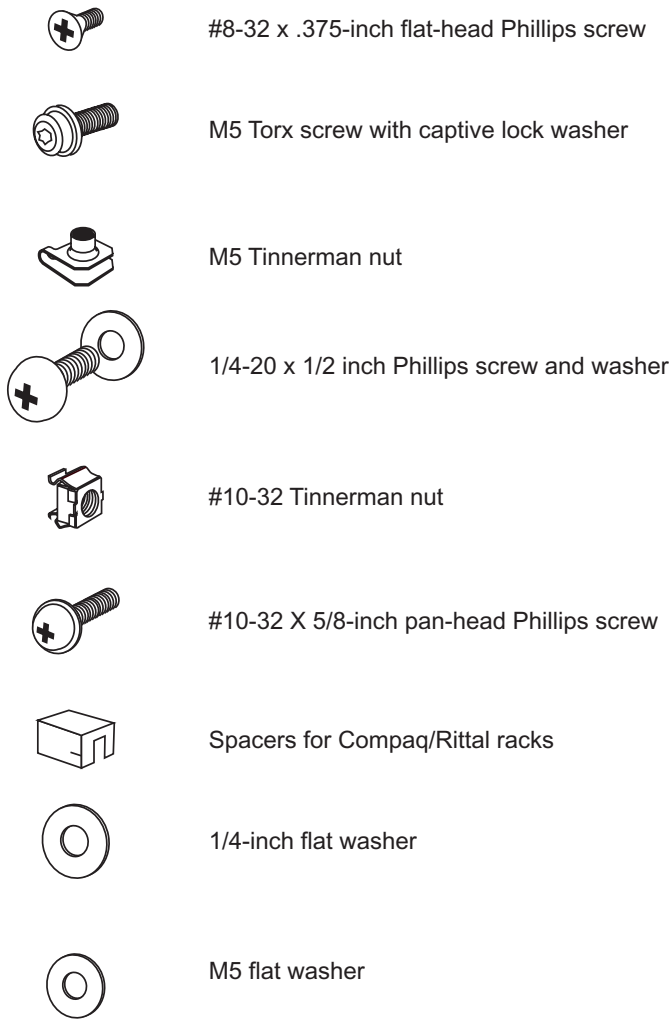

#8-32 x .375-inch flat-head Phillips screw
M5 Torx screw with captive lock washer
M5 Tinnerman nut
1/4-20 x 1/2 inch Phillips screw and washer
#10-32 Tinnerman nut
#10-32 X 5/8-inch pan-head Phillips screw
Spacers for Compaq/Rittal racks
1/4-inch flat washer
M5 flat washer

Figure 4. Hardware Key

Installing the FC 6164 in the Rack

WARNING Mount the switch as low as possible in the rack to ensure that the weight of the switch does not make the rack unstable. 15 Rack Units (RUs) are required (see Figure 5).

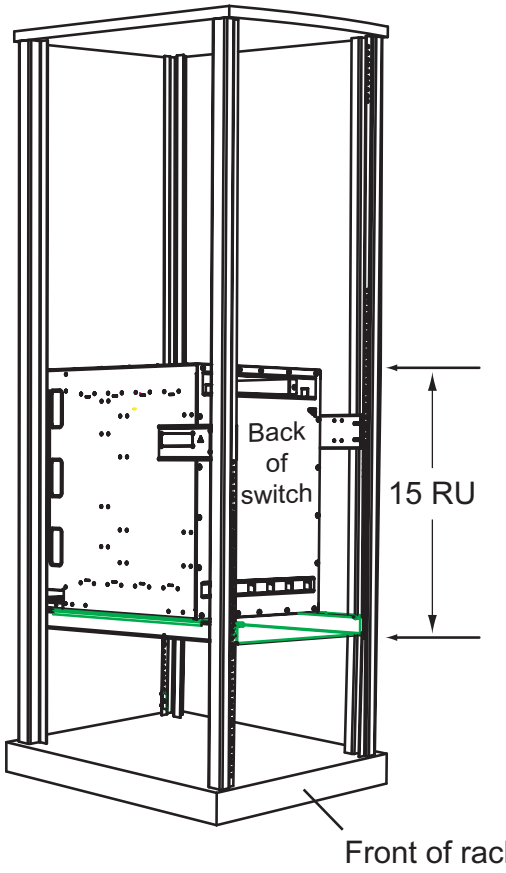


Figure 5. Switch Mounted Back-to-Front and Low in the Rack

CAUTION The switch must be installed with the front end facing the back of the rack. When the switch is mounted this way, the air flows through the switch in the same direction as it does through the other equipment in the rack (see Figure 5).

Note In these instructions, the 15 RUs used to mount the switch are called RU-1 through RU-15 (see Figure 5); RU-1 is the lowest of the 15 RUs.

1. Check the contents of the shipping carton and the kits within the carton to verify that all of the required parts and hardware are available (see Figure 3, Table 7, and Figure 5).
2. Choose a mounting location in the rack for the switch (see the WARNING at the beginning of this section and Figure 5).
3. Install the rail tray in the rack:
   a. Locate the lowest RU of the 15 you chose for mounting the switch (this is RU-1).
   b. Attach the rear rail-tray brackets to the rear rack uprights at RU-1:

      For an HP rack, use 1 M5 torx screw for each bracket (see Figure 6).

      For a Compaq/Rittal rack, insert spacers in the upper and lower holes where the brackets are to be mounted, position the brackets on the spacers, and use 1 M5 torx screw with captive lock washer and two M5 flat washers to attach each bracket (see Figure 6).

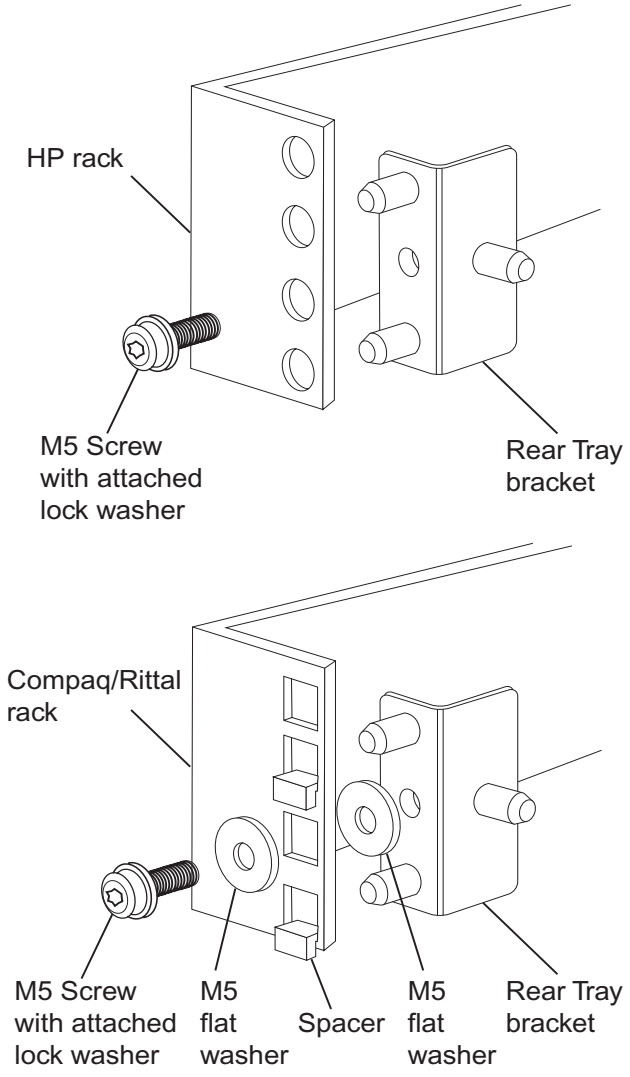


Figure 6. Installing the Rear Rail-Tray Brackets

Note When installing the rail tray in a Compaq/Rittal rack, ignore the mounting instructions on the label attached to the rail tray (some rail trays do not have this label).

c. Install Tinnerman nuts for the top holes of RU-1 in both of the rack's front uprights (see Figure 7).

Note The Tinnerman nuts used for the two types of racks (HP and Compaq/Rittal) are of different styles and different sizes. Refer to Figure 5 and Figure 7 to identify the correct Tinnerman nut to use with the rack you are installing the switch in.

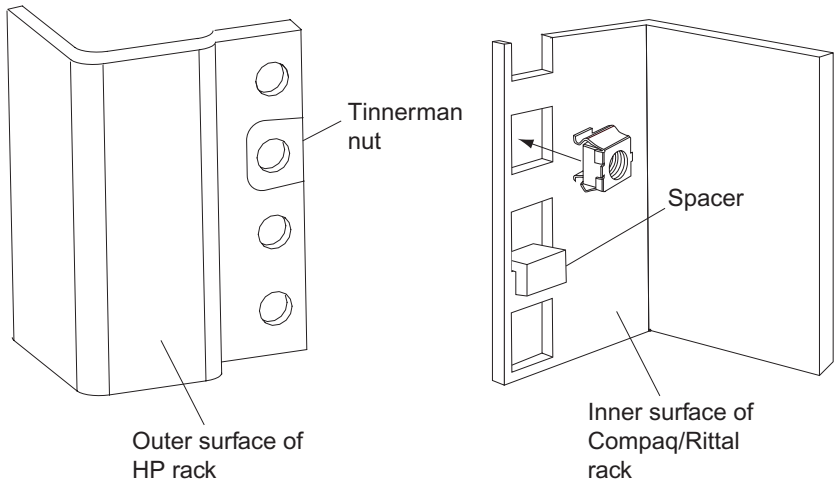


Figure 7. Installing Tinnerman Nuts and Spacers on the Front Uprights

d. For a Compaq/Rittal rack, insert spacers in the holes immediately below the Tinnerman nuts you inserted in Step 3c (see Figure 7).

e. Orient the rail tray as shown in Figure 8, and insert it into the rack from the front. The slots in the sides of the rail tray must slide over the posts on the rear rail-tray brackets, and the posts on the rail tray's front mounting flanges must be inserted in the center holes of RU1.

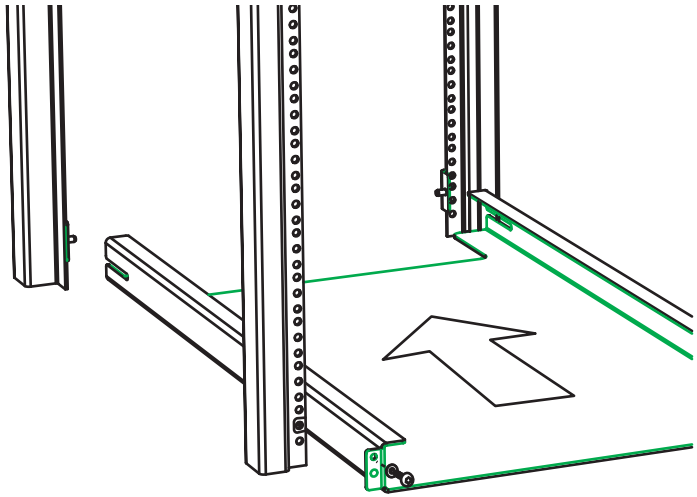


Figure 8. Inserting the Rail Tray in the Rack

f. Insert M5 torx screws through the top holes in both of the rail tray mounting flanges. The screws pass through the holes in the rack uprights and thread into the Tinnerman nuts you installed on the uprights in Step 3c. Tighten the screws.

4. Place a shim plate on each side of the rail tray (see Figure 9).

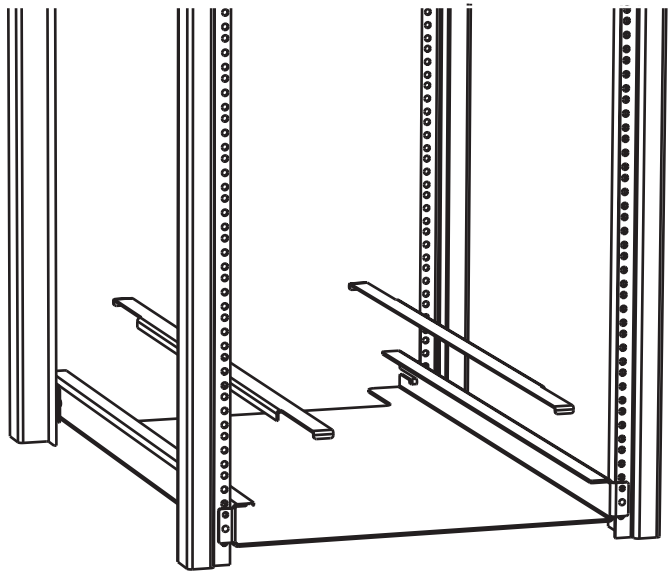


Figure 9. Placing the Shim Plates on the Rail Tray

CAUTION The shim plates must be placed on top of both sides of the rail tray to prevent misalignment between the mounting holes in the switch flanges and the holes in the rack uprights.

5. Insert Tinnerman nuts onto the center holes of RU-5 and the top holes of RU-12 in both of the rack's rear uprights (see Figure 10).

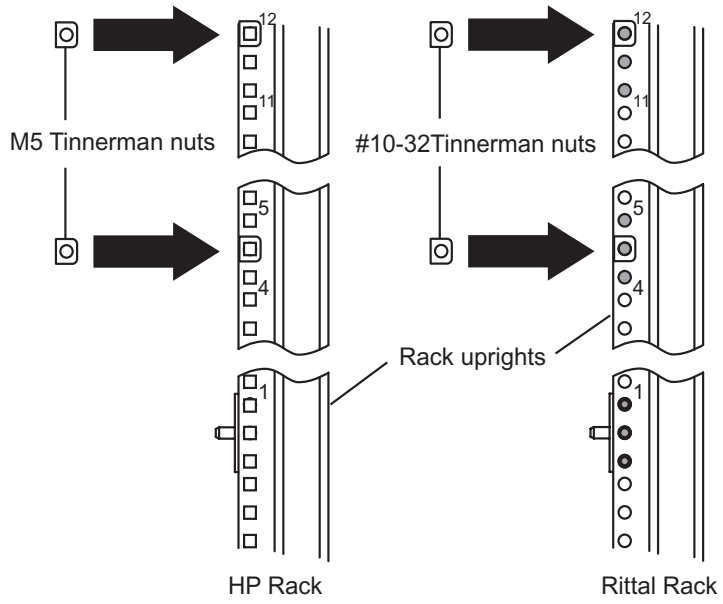


Figure 10. Installing Tinnerman Nuts in RU-5 and RU-12

6. Install the rack-mount brackets on the switch:

   a. The rack-mount brackets consist of a stationary plate and an adjustable plate that are attached to each other with two screws. Remove the screws that attach the adjustable plates to the stationary plates. Set the screws and the adjustable plates aside for later use (see Figure 11).

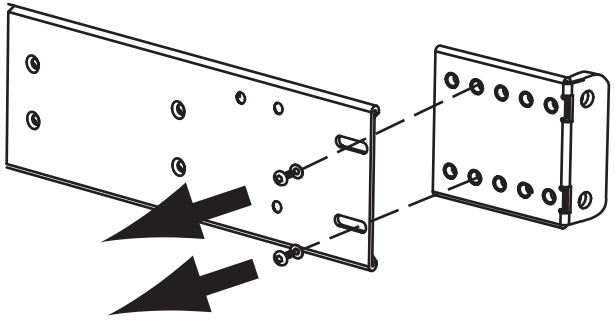


Figure 11. Separating the Rack-Mount Bracket Plates

a. Use four #8-32 x 5/16-inch Phillips flat-head screws to mount one of the stationary plates onto each side of the switch. The plates must be oriented so that the end of the plate that has the slotted holes protrudes past the back of the switch, and if the plate has arrows stamped into it, the arrows must point up (see Figure 12). Do not tighten the screws fully at this time.

Note Some stationary plates have arrows stamped into them, and some do not. The arrow determines which side of the switch the plate must be mounted on. If the stationary plates provided with the switch do not have arrows, they can be mounted on either side.

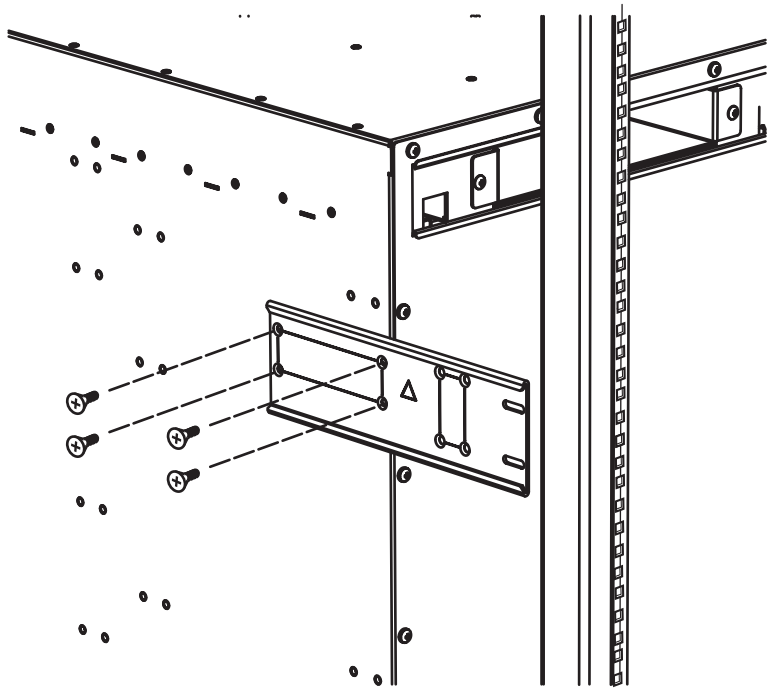


Figure 12. Mounting the Rack-Mount Bracket Stationary Plates to the Switch

Note If you have adequate access to the back of the rack to insert the switch from the back, skip Steps 7, 8, and 9. If you do not have adequate access to the back of the rack, proceed with Step 7.

Note If you cannot insert the switch into the rack from the back, you must remove several pieces of hardware from the sides of the switch at the front end as described in Steps 7, 8, and 9. If you have adequate access to insert the switch into the rack from the back, you can skip these steps.

7. Remove the four #6-32 x ¼-inch flat-head screws that attach each of the two hinge plates to the left side of the switch at the front end (see Figure 13). Set the screws and the hinge plates aside for later use.

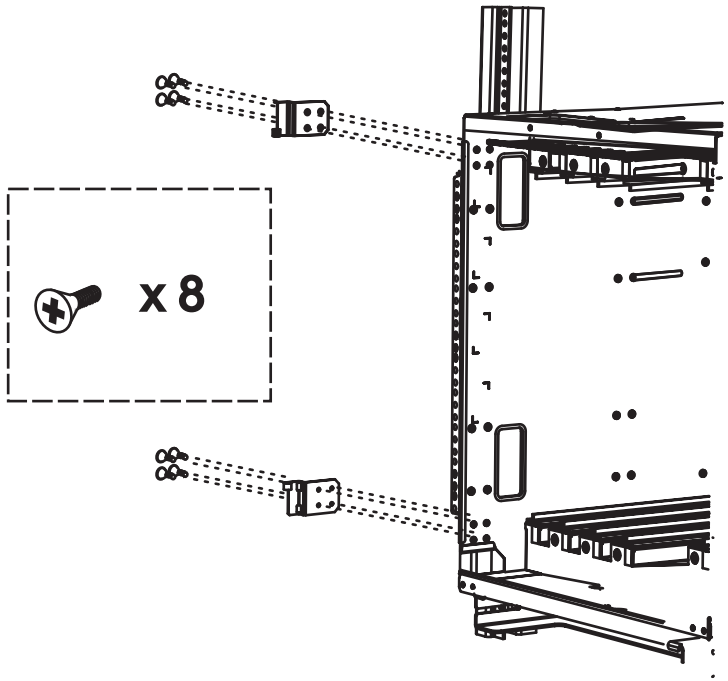


Figure 13. Removing the Hinge Plates from the Switch

8. Remove the two screws that attach the latch plate to the right side of the switch at the front, and remove the latch plate (see Figure 14). Set the latch plate and the screws aside for later use.

Note The latch plate fits through a cutout in the rack-mounting flange on the right side of the switch.

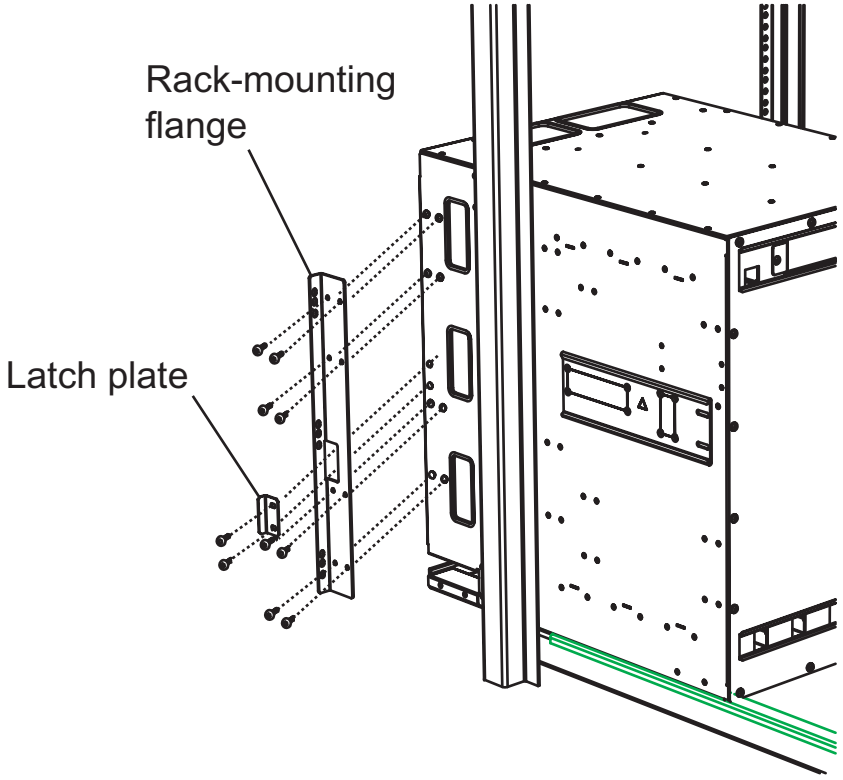


Figure 14. Removing the Latch Plate and the Mounting Flanges

9. Remove the eight #10-32 Phillips screws that attach each of the rack-mounting flanges to the sides of the switch at the front, and remove the rack-mounting flanges (see Figure 14). Set the rack-mounting flanges and the screws aside for later use.

WARNING If the rack you are mounting the switch in is on wheels, make sure the leveling feet are down or the wheels are locked to prevent the rack from moving while you are installing the switch. Failure to prevent the rack from moving could result in injury to personnel and/or damage to the switch, the rack, or other equipment.

10. Insert the switch in the rack:

WARNING The FC 6164 weighs approximately 200 pounds. A lift is required to move and position the switch safely, and at least two people are required to lift and position the switch onto the lift. Two or more people are also required to move the switch from the lift into the rack and when positioning the switch in the rack. Move the switch chassis slowly and carefully at all times, and continue supporting it until it is correctly positioned on the rail tray and fastened to the rack. Use extreme caution when handling or transporting the switch to prevent injury to personnel, damage to the switch, and/or damage to the rack and other equipment mounted in it.

a. Place the switch on a lift. If you are installing the switch from the front of the rack, orient the switch so its front end FACES THE FRONT OF THE RACK is at the edge of the lift. If you are installing the switch from the back of the rack, orient the switch so that its back end is at the edge of the lift. (The switch must be installed so the front of the switch faces the back of the rack.)

b. Position the lift close to the rack, and raise it until the bottom of the switch is even with or very slightly above the top surfaces of the shim plates that you positioned on top of the rail tray in Step 4.

c. Carefully slide the switch from the lift onto the shim plates on the rail tray.

d. Position the switch so that its front end protrudes out the back of the rack approximately six inches.

11. If you inserted the switch into the rack from the back, skip this step.

    Reinstall the removed hardware:

    a. Use the 16 #10-32 Phillips screws you removed in Step 9 to re-attach the rack-mounting flanges to the switch (see Figure 14).

    b. Use the two screws you removed in Step 8 to re-attach the latch plate (see Figure 14). Make sure that there is a gap of approximately 3/16-inch between the edges of the latch plate and the edges of the cutout in the rack-mounting flange.

    c. Orient the hinge plates so that the sides that have the loops face each other (see Figure 15). Use the eight #6-32 x ¼-inch flat-head screws you removed in Step 7 to re-attach the hinge plates to the left side of the switch at the front end (see Figure 13).

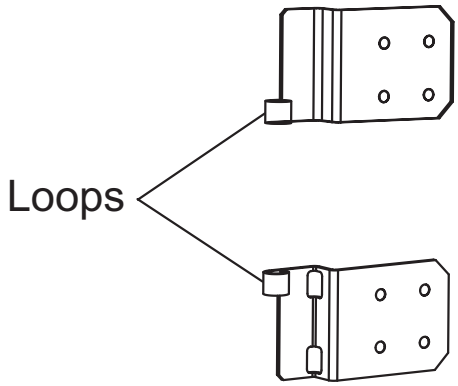


Figure 15. Orienting the Hinge Plates Prior to Reinstallation

12. Re-attach the rack-mount bracket adjustable plates:

    a. From the front of the rack, slide the switch forward a small distance.

    b. Insert one of the adjustable plates into one the stationary plates (see Figure 16).

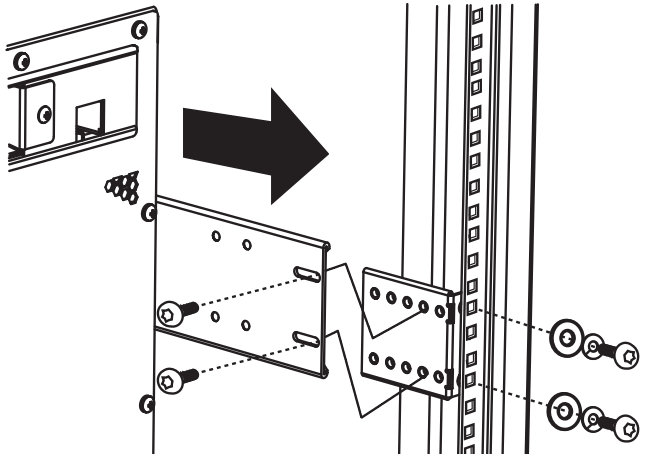


Figure 16. Re-attaching the Rack-Mount Bracket Adjustable Plates

    c. Insert the screws you removed in Step 6a through the slotted holes in the stationary plate and into the second set of threaded holes in the adjustable plate from the rack-mounting flange (see Figure 16). Do not tighten the screws at this time.

    d. Repeat Steps b and c for the rack-mount bracket on the opposite side of the switch.

    e. Move the switch forward in the rack as far as it can go. The amount of movement is limited by the rack-mount bracket adjustable plates contacting the rack uprights.

WARNING The FC 6164 weighs approximately 200 pounds.Two or more people are required when positioning the switch in the rack. Move the switch chassis slowly and carefully at all times, and continue supporting it until it is correctly positioned on the rail tray and fastened to the rack. Use extreme caution when handling or transporting the switch to prevent injury to personnel, damage to the switch, and/or damage to the rack and other equipment mounted in it.

f. Put flat washers on four ¼-20 screws with captive lock washers, and insert the screws through the holes in the rack uprights and into the threaded holes in the flanges of the rack-mount bracket adjustable plates (see Figure 16). Do not tighten the screws at this time.

13. From the back of the rack, insert four #10-32 x 5/8-inch Phillips pan-head screws with captive lock washers through the holes in the rack-mount flanges attached to the front end of the switch and into the Tinnerman nuts you placed in the rack in Step 5 (see Figure 10 and Figure 17). Tighten the screws fully.

Note For an HP rack, you may have to adjust the positions of the Tinnerman nuts to get them to align properly with the holes in the rack uprights. If necessary, use a screwdriver blade inserted through the holes in the rack uprights to reposition the Tinnerman nuts.

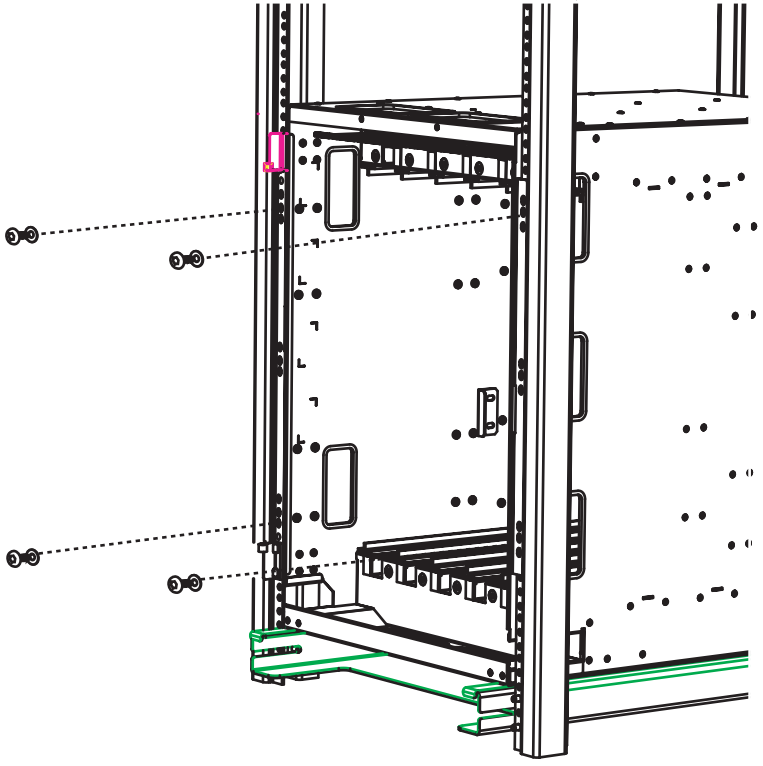


Figure 17. Attaching the Rack-Mount Flanges to the Rack

14. Fully tighten the screws that attach the rack-mount bracket adjustable plates to rack uprights, then fully tighten the screws that attach the adjustable plates to the stationary plates and the screws that attach the stationary plates to the switch chassis (see Figure 16).

15. Assemble the plenum:

    a. Position the bottom panel of the plenum on a flat surface with the two folded ends facing up (see Figure 18).

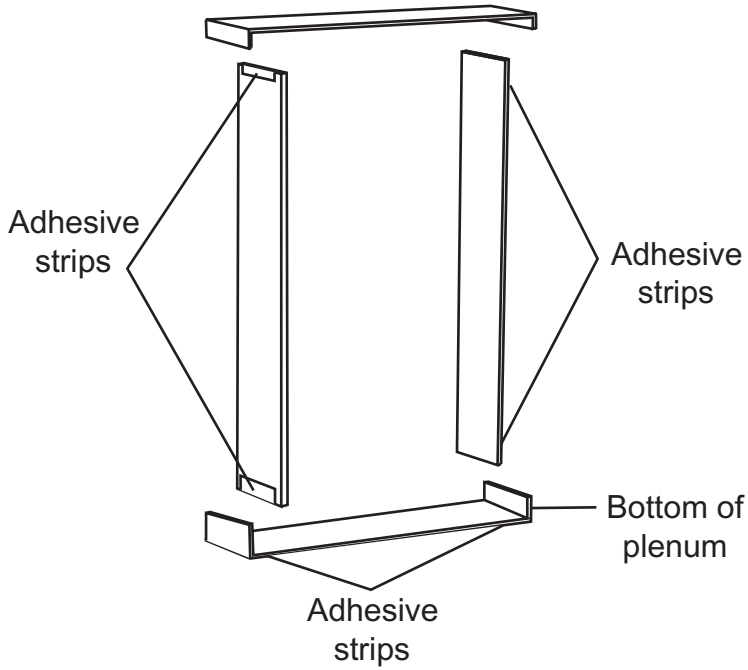


Figure 18. Assembling the Plenum

    b. Remove the paper backing from one of the adhesive strips on one of the plenum side panels, and carefully position the side panel against the inner surface of one of the folded ends of the bottom panel (see Figure 18). Press the side panel firmly against the upright end of the bottom panel to ensure that the adhesive strip on the side panel makes full contact with the end of the bottom panel. You can use a screwdriver handle to increase the pressure you apply when joining the parts.

    c. Repeat Step 15b for the other side panel.

    d. Remove the paper backing from the adhesive strips on the upper ends of both plenum side panels.

e. Carefully position the plenum top panel over the side panels so that the folded ends of the top panel face down and are outside of the side panels.

f. With the top panel aligned with the side panels, press one of the side panels firmly against the inner surface of the folded end of the top panel to ensure that the adhesive strip on the side panel makes full contact with the folded end of the top panel. Repeat this step for the other side panel.

16. Install the plenum in the rack:

a. Remove the paper backing from the two adhesive strips on the bottom surface of the plenum.

b. Position the plenum against the back of the switch and slide it down until the adhesive strips on the underside of the plenum contact the shim plates that are on top of the rail tray (see Figure 19).

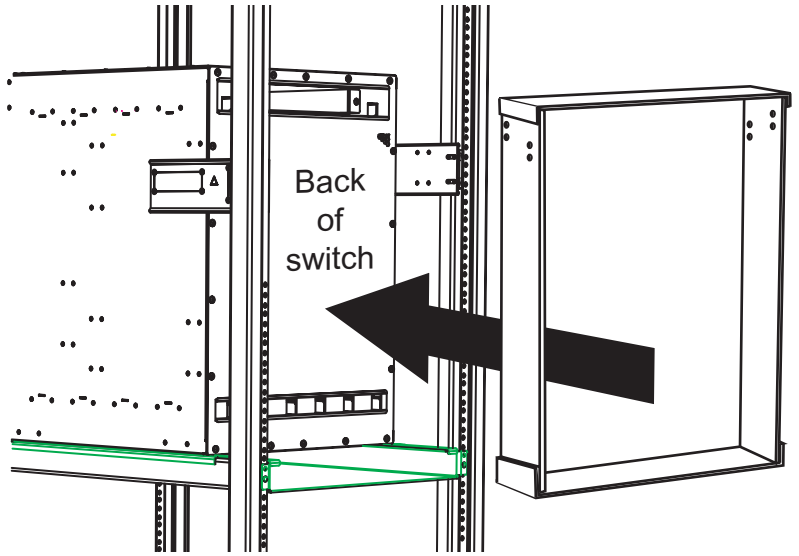


Figure 19. Inserting the Plenum

c. Press down firmly on the bottom panel of the plenum above the adhesive strips to ensure that the adhesive strips make full contact with the shim plates on top of the rail tray.

17. Install the front bezel:

    a. Orient the front bezel so that its outer surface is facing you.

    a. Align the bottom end of the front bezel with the bottom edge of the rail tray (see Figure 20). There are two alignment posts and two spring clips on each side of the bezel that grip the rack uprights and hold the bezel in position. Each of the lower alignment posts fits into the second unused hole above the front mounting flange on each side of the rail tray.

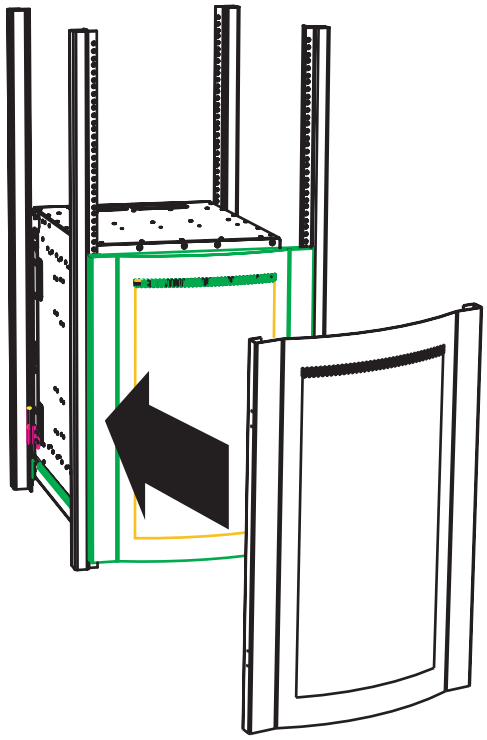


Figure 20. Installing the Front Bezel

    b. Press the sides of the bezel against the rack uprights until the bezel snaps into place. Snap the bottom end in first and then the top end.

    c. Inspect the bezel to ensure that it is installed so that its top edge is aligned with the top surface of the switch.

18. Install the switch door:

    a. Rotate the knobs on the switch door so that they are in the down position and the springs are compressed.

    b. Position the door so that the hinge pins are between the loops on the hinge plates mounted on the switch (see Figure 15 and Figure 21).

Note When you rotate the door to the closed position, the spring-loaded hinge pins will snap into the loops on the hinge plates.

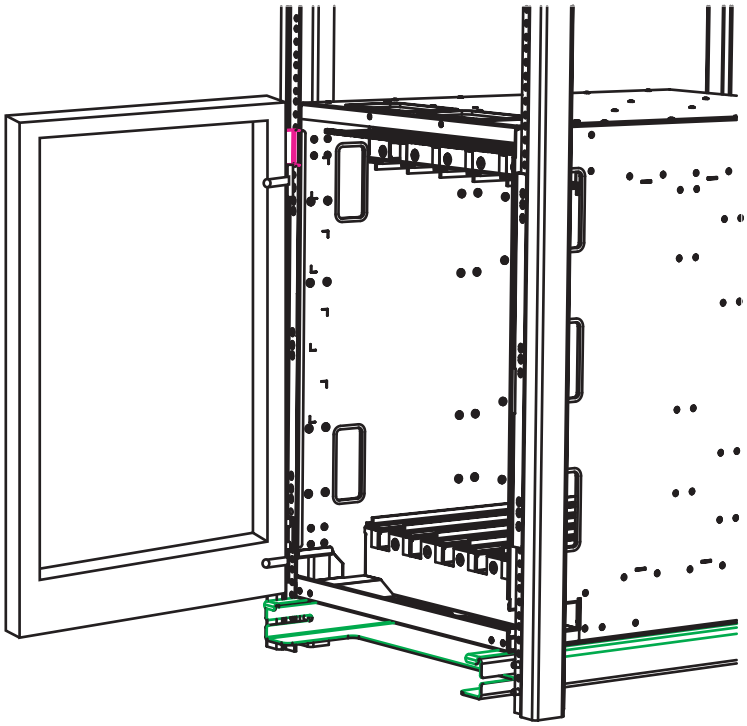


Figure 21. Installing the Switch Door

Note To ensure that the switch does not emit RFI, the switch door must be installed, and it must be kept closed during normal operation.

19. Connect each of the six power cables to a power source, and verify that each power cable is firmly seated in the power connector of the corresponding switch.

Note Each time the switch is powered on, it automatically performs a power on self test (POST), which takes approximately two minutes and is complete when LED activity stops. This test can be disabled by entering the following at the Telnet prompt: `diagDisablePost`

If a malfunction occurs during POST, error messages are written to the system error log, which is accessible by Telnet. If the malfunction prevents the switch from completing the boot process, the switch prompt does not display when the serial port is connected.

Configuring the FC 6164

1. Obtain a copy of the FC 6164 worksheet provided in Appendix A, "FC 6164 Worksheet", and enter the IP address and related information for each switch, as provided by the LAN (local area network) administrator.
2. Replace the factory IP address and related information for each of the six switches with the information provided by the LAN administrator.
   a. Disable any serial communication programs running on the workstation, such as synchronization programs for a PDA.
   b. Remove the shipping plug from the serial port on switch 1 (the switch on the far left) and insert the serial cable provided with the FC 6164.
   c. Insert one end of a serial cable into the serial port.
   d. Connect the other end of the serial cable to an RS-232 serial port on the workstation. If necessary, you can remove the adapter to allow for RJ45 serial connection to the workstation.

e. Open and configure a terminal emulator application (such as HyperTerminal on Windows 95 or NT, or TERM in a UNIX environment) as follows:

Parameter	Value
Bits per second:	9600
Databits:	8
Parity:	None
Stop bits:	1
Flow control:	None
Function arrows and Ctrl keys act as:	Terminal keys
Emulation:	Autodetect

f. From the terminal emulator application, log on to the first switch through the serial connection.

g. Specify the new IP address by entering the following:

```
ipAddrSet
```

h. Enter the following information at the corresponding prompts:

- `Ethernet IP Address [current]:` Enter new Ethernet IP address (the default is 10.77.77.77).
- `Ethernet Subnetmask [current]:` Enter new Ethernet subnetmask (the default is 0.0.0.0).
- `Fibre Channel IP Address [current]:` Enter new fibre channel IP address if desired.
- `Fibre Channel Subnet Mask [current]:` Enter new fibre channel subnet mask if desired.
- `Gateway Address [current]:` Enter new gateway address (the default is 172.17.1.1).
- `Set IP address now? [y = set now, n = next reboot]:` Enter "y" to set now by rebooting the switch.

i. You can verify the address was set correctly by entering the following:

```
IPaddressShow
```

j. Remove the serial cable and replace the shipping plug.

k. Repeat steps a through j for the remaining five switches in the FC 6164.

Note The serial port is intended for initial setting of the IP address and for service purposes. Using the serial port during normal switch operation or for regular maintenance is not recommended.

---

3. Connect all six switches by Ethernet to the LAN on which the workstation resides.

   a. Remove the shipping plug from the Ethernet port on each switch.

   b. Insert one end of an Ethernet cable in each Ethernet port.

   c. Connect the other end to an existing Ethernet 10/100 Base-T LAN.

Note When the Ethernet connection is made, remote Telnet and Web access is available. If the FC 6164 becomes connected to a larger network by this step, ensure that the system is not being modified from more than one connection during the following steps.

---

4. Modify the domain IDs if desired.

Note The default domain IDs on the six original switches shipped with the FC 6164, starting with switch 1, are 231, 232, 233, 234, 235, and 236. If a domain ID is already in use when the FC 6164 is connected to the fabric, the domain ID for the new switch is automatically reset to a unique value. The current domain IDs in use can be determined by issuing the Telnet command `fabricShow` on a switch connected to the larger SAN fabric.

---

   a. Log on with administrative privileges to the first switch, using a Telnet connection.

   b. Disable the switch by entering the following:

      ```
      switchDisable
      ```

   c. Enter the following:

      ```
      configure
      ```

d. Enter "Y" after the "`Fabric parameters`" prompt.

```
Fabric parameters (yes, y, no, n): [no] y
```

e. Enter a unique domain ID (such as the domain ID used by the previous switch, if still available).

```
Domain: (1..239) [1] 3
```

f. Complete the remaining prompts (or press CTRL+D to accept the remaining settings `without completing all the prompts).`

g. Re-enable the switch by entering the following:

```
switchEnable
```

h. Repeat Steps a through g for the remaining switches.

5. Specify the desired status policies for your fabric.

   a. Log on to the first switch by Telnet.

   b. Enter the following at the prompt:

   ```
   switchStatusPolicySet
   ```

   c. Specify the desired status policies. To completely deactivate the alarm for a particular condition, enter "0" at the prompt for that condition.

   d. Repeat Steps a through c for the remaining five switches in FC 6164.

6. Check the FC 6164 for port or ISL issues.

   a. Log on with administrative privileges by Telnet to one of the switches in the integrated fabric.

   b. Enter the following at the Telnet prompt:

   ```
   islTopoShow
   ```

   This command provides general information about all the switches in the FC 6164. Any problems are indicated by an error condition in the Status column.

7. Check each switch for port or ISL issues.
    a. Log on with administrative privileges by Telnet to one of the switches in the group.
    b. Enter the following at the Telnet prompt:

        ```
        islTopoCheck
        ```

        This command provides detailed information about the local switch (the switch currently accessed by Telnet). If there are any problems, the Status column indicates an error condition.
    c. Repeat Steps a through b for the remaining switches in the group.
8. Add GBICs and cables as needed to the user ports.
    a. Remove the shipping plug from the user ports to be used.
    b. Position the GBIC so that the key (the ridge on one side) on the GBIC is aligned with the slot in the user port.
    c. Insert each GBIC into the port until it is firmly seated and the latching mechanism locks. The GBIC module is keyed so that it can be inserted in only one way. If the module does not slide in easily, try reversing it.
    d. Connect fiber optic cables to the user GBICs as appropriate to the fabric topology.
9. Back up the configuration for each of the six switches in the FC 6164, after any zoning configurations and other changes are completed. This ensures a complete configuration is available for uploading to a replacement switch, if required.
    a. From the workstation, establish a Telnet connection to the switch you want to back up, and log on with administrative privileges.
    b. Enter the following command to download the configuration to the server.

        ```
        configupload
        ```

Note A routine backup of the configuration for each switch in the FC 6164 is recommended at regular intervals, to ensure a fairly current configuration is available for uploading to a replacement switch, if required.

4

MAINTENANCE PROCEDURES

Switch Replacement Procedure

Use this procedure to remove and replace any of the six switches in the FC 6164.

Note For detailed information about any of the Fabric OS commands referenced in this chapter, enter `help` plus the `[command name]at` the Telnet prompt. For example, to display information about the `fabricShow` command, enter the following: `help fabricShow`

The overall procedure of replacing a switch involves the following secondary procedures, described on the indicated pages:

1. "Preparing to Remove the Switch From the FC 6164" on page 59
2. "Physically Uninstalling the Switch" on page 61
3. "Installing the New Switch in the Chassis" on page 63
4. "Configuring the New Switch" on page 64
5. "Adding the New Switch to the Integrated Fabric" on page 69

Note The steps are numbered consecutively throughout all the secondary procedures.

Time Required

Approximately 45 minutes.

Items Required

- Silkworm 2250 switch
- Fabric OS a2.4.1
- FC 6164 Fabric Watch profile. (Configuration profile)
- Computer workstation with access to the switches in the FC 6164.
- FC 6164 worksheet, provided in Appendix A, “FC 6164 Worksheet”.
- Number 2 Phillips screwdriver.
- If more than one switch is being replaced at the same time, labels are needed for identifying the different Ethernet and serial cables when they are disconnected.

Procedure

Note If multiple switches are being replaced, the simplest approach is to replace one switch at a time.

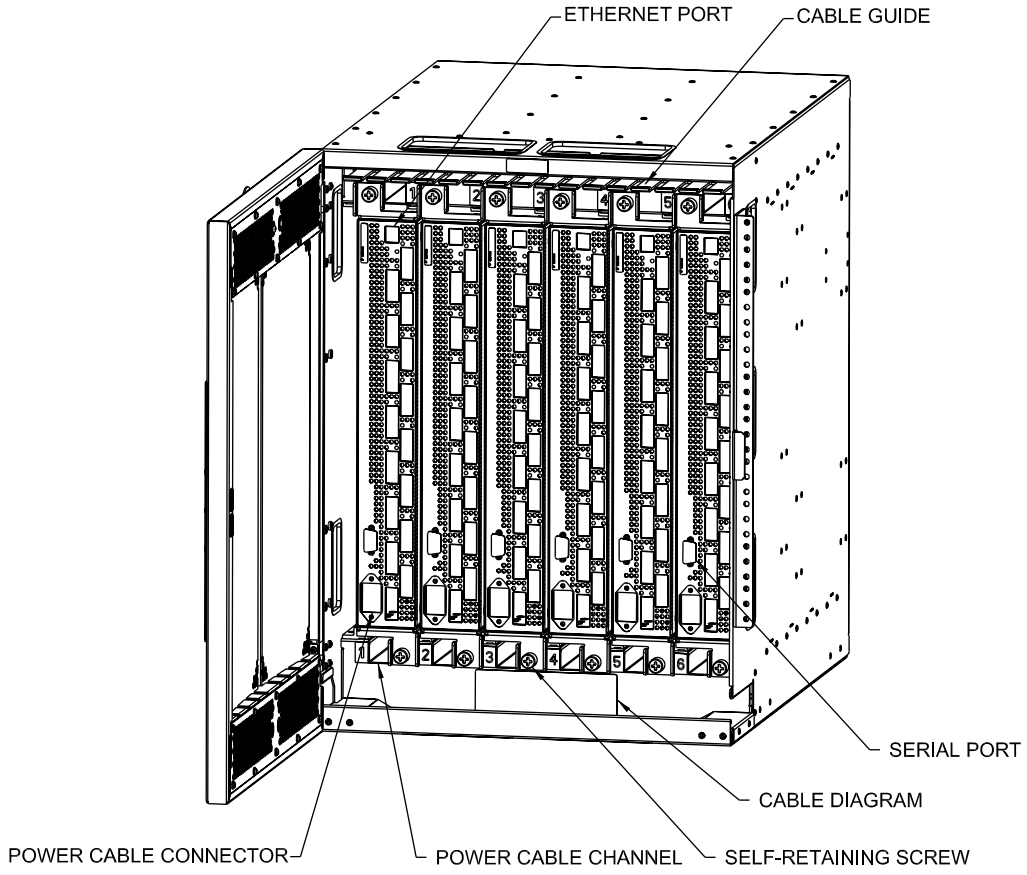


Figure 22. FC 6164 with All Switches Installed (Fiber Optic Cables and Other Cables Not Shown)

Preparing to Remove the Switch From the FC 6164

1. Identify the worldwide name (WWN) and the domain ID of the faulty switch. If this information is already recorded on the FC 6164 worksheet (provided in Appendix A, "FC 6164 Worksheet"), continue with step 2. If the information is not already recorded, perform Steps, a through c.

   a. From a computer workstation, establish a Telnet connection to one of the functioning switches in the FC 6164, and log on with administrative privileges.

b. Enter `sgroupShow` at the Telnet prompt to display group information. This command lists the WWNs for each switch in the FC 6164, beginning with switch 1 (the switch on the far left).

Example

```
reg101:admin> sgroupShow

Group Type    Group Name   Member WWN

==============================================

S64_6_1       East Lab     10:00:00:60:60:10:60:11

                           10:00:00:60:60:10:60:22

                           10:00:00:60:60:10:60:33

                           10:00:00:60:60:10:60:44

                           10:00:00:60:60:10:60:55

                           10:00:00:60:60:10:60:66
```

Note The `fabricShow` command provides information about all the switches in the larger SAN fabric. For details about the `fabricShow` command, refer to the Fabric OS v2.2 manual.

c. Record the WWNs, domain IDs, IP addresses, and other relevant information for all switches in the group on the FC 6164 worksheet (provided in Appendix A, "FC 6164 Worksheet").

Note Keep the completed worksheet readily available for future work on the FC 6164. However, do not tape the worksheet to the front door or rear panel, to prevent disruption of airflow through the chassis.

2. If the faulty switch is partly or fully operational, back up the current configuration.

Note Creating a backup copy of the switch configuration is recommended for each switch in the FC 6164. This preserves zoning and other switch-specific information.

a. From a workstation, establish a Telnet connection to the switch that is being replaced, and log on as administrator.

b. Enter the following command to disable the switch:

```
switchDisable
```

c. Enter the `configupload` command to upload the configuration to the server.

Physically Uninstalling the Switch

3. Physically disconnect the faulty switch.

Note These switches do not have an On/Off button; they are powered on or off by connecting or disconnecting the power cord. It is not necessary to power off the switches that are connected to the faulty switch.

a. Disconnect the power cable, leaving the cable in the channel below the switch.

b. Disconnect the Ethernet cable and the serial cable. If disconnecting more than one switch at a time, label each of the Ethernet and serial cables (if used) with the switch number before disconnecting.

CAUTION The fiber optic cables are fragile and should not be bent to a radius of less than 0.5 inches.

c. Ensure that each of the fiber optic cables are still labeled with the port and switch number.

Note The exact cabling configuration shown in the diagram must be implemented in order for the FC 6164 to operate correctly.

d. Disconnect each of the fiber optic cables from the faulty switch by firmly grasping the connector housing (black) on the cable, and pulling the cable from the GBIC.

4. Remove the switch from the chassis.

   a. Unscrew the two 1/4-20 Phillips self-retaining screws that fasten the switch brackets to the chassis (see Figure 23). Use a number 2 Phillips screwdriver.

   b. Carefully move the cable harness out of the way so that the switch you can slide forward without bending the cables.

   c. Slide the switch forward and remove from the chassis.

5. Remove the two mounting brackets from the switch by unscrewing the four 8-32 x 5/16 long Phillips panhead screws from each bracket. Set the brackets and screws aside for the new switch.

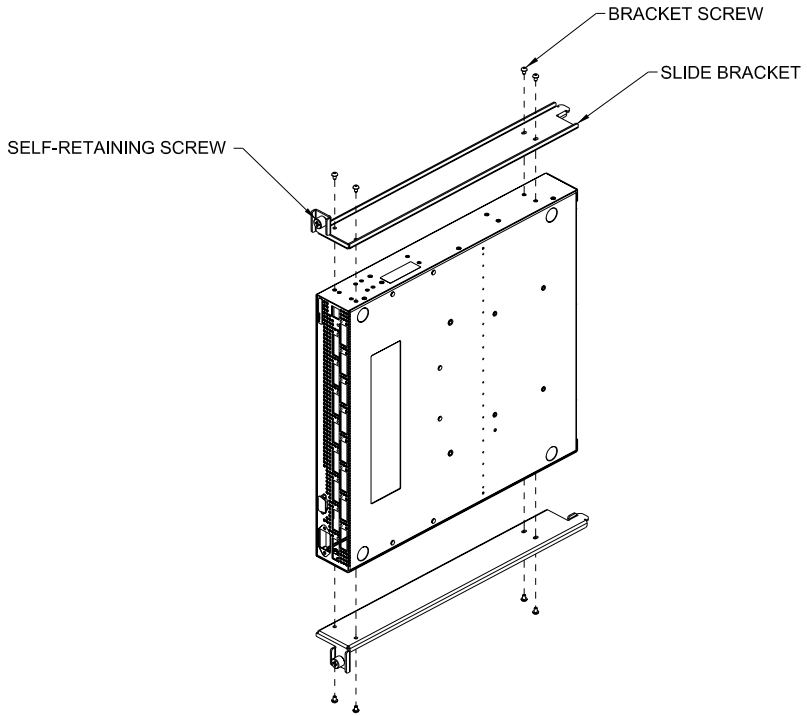


Figure 23. FC 6164 with the Switch Mounting Brackets (Shown in Exploded View)

6. Remove all the GBICs from the faulty switch.

Note Refer to the GBIC manufacturer's documentation for specific instructions about inserting and removing GBICs.

Installing the New Switch in the Chassis

7. Insert the GBICs into the new switch, inserting each GBIC into the port until it is firmly seated and the latching mechanism becomes locked.

   The GBIC module is keyed so that it can be inserted in one way only. If the module does not slide in easily, try reversing it. The GBIC D-connector must line up with the D-connector inside the GBIC port.

8. Install the mounting brackets on the new switch.

   a. Position one of the brackets flat against the side of the switch, so that the end with the bent lip is at the front of the switch (see Figure 23), and align the holes in the bracket with the holes in the side of the switch.

   b. To ensure correct bracket alignment, assemble screws in the following pattern:

      Position and finger tighten the first 8/32 x .312 panhead Phillip screw in the smallest hole in the bracket.

      Position and finger tighten the second 8/32 x .312 panhead Phillip screw in the oblong (slotted) hole.

      Position and finger tighten the remaining two 8/32 x .312 panhead Phillip screws in the remaining two holes.

      Tighten all four screws to a torque of 8 inch-pounds.

   c. Repeat Steps a through b with the second bracket on the other side of the switch.

9. Install the new switch in the chassis.

   a. Orient the switch so that the power connector is at the bottom of the chassis (see Figure 23), and slide the switch into the available space.

   b. Tighten the two self-retaining screws that fasten the switch brackets to the chassis, using a number 2 Phillips screwdriver to tighten to 40 inch-pounds.

10. Connect the following:
    - power cable to the power connector
    - serial cable to the serial port (if used)
    - Ethernet cable to the Ethernet port

Note Do not connect the ISL (interswitch link) or user fiber optic cables until after the switch is configured.

Configuring the New Switch

Note The switch can be accessed simultaneously from multiple connections; ensure that the system is not modified from more than one connection during the following procedure.

11. Replace the factory IP address and related information with the address information used by the previous switch.
    a. Connect the new switch to a workstation by serial cable.
    b. Open and configure a terminal emulator application (such as HyperTerminal) as follows:

Parameter	Value
Bits per second:	9600
Databits:	8
Parity:	None
Stop bits:	1
Flow control:	None
Function arrows and Ctrl keys act as:	Terminal keys
Emulation:	Autodetect

    c. From the terminal emulator application, log on to the new switch through the serial connection.

d. Specify the new IP address by entering the following:

   `ipAddrSet`

e. Enter the following information at the corresponding prompts:

   – `Ethernet IP Address [current]:` Enter new Ethernet IP address (the default is 10.77.77.77).

   – `Ethernet Subnetmask [current]:` Enter new Ethernet subnetmask (the default is 0.0.0.0).

   – `Fibre Channel IP Address [current]:` Enter new fibre channel IP address if desired.

   – `Fibre Channel Subnet Mask [current]:` Enter new fibre channel subnet mask if desired.

   – `Gateway Address [current]:` Enter new gateway address (the default is 172.17.1.1).

   – `Set IP address now? [y = set now, n = next reboot]:` Enter "y" to set the IP address now by rebooting the switch.

f. You can verify the address was correctly set by entering the following:

   `ipAddrShow`

12. Log on with administrative privileges to the new switch, using a Telnet connection.

13. From a computer workstation, disable the diagnostic tests that run after each reboot by entering the following at the Telnet prompt:

    `diagDisablePost`

14. Set the domain ID to the value used by the previous switch, if still available.

    The default domain IDs on the six original switches shipped with the FC 6164 are (starting with switch 1) 231, 232, 233, 234, 235, and 236.

Note If the domain ID (whether the default or a selected ID) is already in use when the switch is connected to the fabric, it is automatically reset to a unique value. You can determine which domain IDs are in use by issuing the Telnet command `fabricShow` on one of the switches in the integrated fabric.

a. Disable the switch by entering the following:

```
switchDisable
```

b. Enter the following:

```
configure
```

c. Enter "Y" after the "`Fabric parameters`" prompt.

```
Fabric parameters (yes, y, no, n): [no] y
```

d. Enter a unique domain ID (such as the domain ID used by the previous switch, if still available).

```
Domain: (1..239) [1] 3
```

e. Complete the remaining prompts (or press Ctrl+D to accept the defaults without completing the prompts).

f. Re-enable the switch by entering the following:

```
switchEnable
```

15. Download the switch configuration, if one was uploaded from the previous switch (see Step 2).

a. Disable the switch by entering the following:

```
switchDisable
```

b. Enter the following at the Telnet prompt to download the configuration from the server to the switch:

```
configDownload
```

Several prompts display to gather information about the file being downloaded.

c. Enter the requested information at the prompts, pressing Enter after each entry:

   – `Server Name or IP Address [host]:` Name or IP address of computer on which configuration file is located.

   – `User Name [user]:` Login name required to access computer.

   – `File Name [/usr/switch/firmware]:` Filename or absolute path of configuration file.

   – `Protocol (RSHD or FTP) [rshd]:` Press Enter to use RSHD, or enter FTP to use FTP protocol.

   – `Password:` Enter the FTP password (only displays if FTP protocol was selected).

d. Reboot the switch by entering the following at the prompt and pressing Enter:

   ```
   reboot
   ```

e. Re-enable the switch by entering the following:

   ```
   switchEnable
   ```

16. If no previous switch configuration was downloaded, or the switch configuration from the previous switch contained a modified Fabric Watch profile and you want to revert to the default settings, download the FC 6164 Fabric Watch profile to the new switch.

   a. Ensure that the profile is available on the workstation or network.

   b. Disable the switch by entering the following:

      ```
      switchDisable
      ```

   c. Enter the following at the Telnet prompt to download the profile from the server to the switch:

      ```
      configDownload
      ```

      Several prompts display to gather information about the file being downloaded

d. Enter the requested information at the prompts, pressing Enter after each entry:

   – `Server Name or IP Address [host]:` Name or IP address of computer on which profile is located.

   – `User Name [user]:` Login name required to access computer.

   – `File Name [/usr/switch/firmware]:` Filename or absolute path of Fabric Watch profile.

   – `Protocol (RSHD or FTP) [rshd]:` Press Enter to use RSHD, or enter FTP to use FTP protocol.

   – `Password:` Enter the FTP password (only displays if FTP protocol was selected).

e. Re-enable the switch by entering the following:

   ```
   switchEnable
   ```

17. Implement the downloaded items:

- If a configuration file was downloaded to the new switch, the switch must be rebooted to implement the new configuration. To reboot the switch, enter the following at the prompt and press Enter (this is automatically a fastboot due to the command entered in Step 13):

  ```
  reboot
  ```

- If no configuration was downloaded, a reboot is not required, but the switch must still reload the Fabric Watch profile. To reload the profile, enter the following at the prompt and press Enter:

  ```
  fwConfigReload
  ```

18. Specify any desired custom status policies.

Note If the configuration of the previous switch was downloaded to the new switch, the status policies will already match those of the previous switch.

---

a. Log on to the new switch by Telnet.

b. Enter the following at the prompt and press Enter:

   ```
   switchStatusPolicySet
   ```

c. Specify the desired status policies. To completely deactivate the alarm for a particular condition, enter “0” at the prompt corresponding to that condition, and press Enter.

Adding the New Switch to the Integrated Fabric

19. Physically connect the ISL (interswitch link) fiber optic cables to the appropriate ISL ports.

    a. Select a cable connector and determine the appropriate ISL port, according to the switch and port number indicated on the label on the cable connector.

       The correct ISL cable configuration can be verified using either of the following:

       – cabling diagram (Figure 24; also located inside the chassis).

       – The cable configuration table (Table 8).

Note Connecting the ISL cables to ports other than those identified in the diagram and table prevent the FC 6164 from operating correctly.

---

    b. Line up the keyed side (ridged) of the cable connector with the notch in the GBIC.

    c. Insert the cable connector into the GBIC until the cable connector is firmly seated.

    d. Repeat Steps a through c for the other end of the cable.

    e. Verify the LEDs for the ports at each end of the cable display a steady green. If any one does not, try re-inserting the corresponding GBIC into the switch, and then re-inserting the cable connector into the GBIC.

    f. Repeat steps a through d for the remaining cables.

20. Thread the ISL cables through the cable guide at the top of the chassis, for organized cable management.

21. Connect the user fiber optic cables to the user ports, as appropriate to the fabric topology.

22. Provide the position number of the new switch to the existing FC 6164 group. The position number pertains to the position of the switch in the chassis switch is on the far left, and switch 6 is on the far right.

    a. Log by Telnet onto one of the switches that was not replaced.

    b. Enter the following command:

       ```
       sgroupSWReplace
       ```

    c. Provide the requested information at each prompt:

       – `Please Enter Group Name: [ ]` Enter the name of the existing group. The name cannot be null or contain blank spaces, and can be up to 32 characters in length.

       – `Old WWN: [ ]` Enter (in quotes) the WWN of the switch that was removed from the group.

       – `New WWN: [ ]` Enter (in quotes) the WWN of the new switch.

       – `Which switch would you like to replace? [ ]`

       ```
       Position    WWN
       1           10:00:00:60:69:10:2a:c0
       2           10:00:00:60:69:10:4a:c1
       3           10:00:00:60:69:10:2b:34
       4           10:00:00:60:69:10:50:7a
       5           10:00:00:60:69:10:4b:a7
       6           10:00:00:60:69:10:29:8e
       Please enter position number: (1..6) [0] 2
       ```

       – `Enter new replace member by domain#? (yes, y, no, n): [no] y`

       – `Please enter domain ID of the replacement switch: (1..239) [0] 9`

       ```
       Committing configuration...done.
       ```

    The updated group information is communicated to all switches in the group.

23. Check the fabric for port or ISL issues.

    a. Log on with administrative privileges by Telnet to one of the switches in the integrated fabric.

    b. Enter the following at the Telnet prompt:

       `islTopoShow`

       This command provides general information about all switches in the group. Any problems are indicated by an error condition in the Status column.

24. Check each switch for port or ISL issues.

    a. Log on with administrative privileges by Telnet to one of the switches in the group.

    b. Enter the following at the Telnet prompt:

       `islTopoCheck`

       This command provides detailed information about the local switch (the switch currently accessed by Telnet). If there are any problems, the Status column indicates an error condition.

    c. Repeat Steps a through b for each of the remaining switches in the group.

ISL Cable Replacement Procedure

Use this procedure to replace an ISL (inter-switch link) fiber optic cable for the FC 6164. Replacing an ISL fiber optic cable in the FC 6164 involves the following main steps:

1. “Remove the faulty cable from the chassis.” on page 72.
2. “Connect the new ISL cable to the appropriate ports.” on page 72.
3. “Check the fabric for port or ISL issues.” on page 73
4. “Check each switch for port or ISL issues.” on page 73

The ISL Cable FRU kit provides a single fiber optic cable with a label pack, and is available from your switch supplier.

Time required:
Approximately 10 minutes.

Items required:
- new ISL cable and label pack
- computer workstation with access to the switches in the FC 6164
- color-coded ISL cabling diagram (located inside the chassis)
- FC 6164 worksheet, provided in Appendix A, “FC 6164 Worksheet”

Procedure

Replacing the ISL Cables

CAUTION The fiber optic cables are fragile and should not be bent to a radius of less than 0.5 inches.

Note It is not necessary to power off the switches before disconnecting ISL cables. If multiple ISL cables are being replaced, the simplest approach is to replace one cable at a time.

1. Remove the faulty cable from the chassis.
   a. Disconnect each end of the faulty cable by firmly grasping the connector housing (black) and pulling the cable from the GBIC (do not remove the GBIC).
   b. Remove the faulty cable from the cable guide.
2. Connect the new ISL cable to the appropriate ports.
   a. Determine the correct switch and port number for each end of the new cable. You can determine this by one of the following methods:
      – labels on the faulty cable
      – table provided in this document (Table 8)
      – color-coded cable diagram provided in this document (Figure 24), and also provided inside the chassis

b. From the label set, remove the two appropriate color-coded switch and port labels. Wrap one label around one end of the cable and wrap the second label around the other end of the cable.

c. Line up the keyed cable connector on one end of the cable with the notch in the GBIC of the appropriate port and switch.

d. Insert the cable connector into the GBIC until the cable connector is firmly seated.

e. Repeat Step c and Step d for the other end of the cable.

f. Thread the new ISL cables through the cable guide at the top of the chassis, for organized cable management.

3. Check the fabric for port or ISL issues.

   a. From a computer workstation, log on with administrative privileges by Telnet to one of the switches in the group.

   b. Enter the following at the Telnet prompt:

      `islTopoShow`

      This command provides general information about all the switches in the group. The results of this command are valid as soon as the fabric stabilizes (the port LEDs stop flickering) after the switches are reconnected. If there are any problems, the Status column in the `islTopoShow` display indicates an error condition.

4. Check each switch for port or ISL issues.

   a. From a computer workstation, log on with administrative privileges by Telnet to one of the switches in the group.

   b. Enter the following at the Telnet prompt:

      `islTopoCheck`

      The `islTopoCheck` command provides detailed information about the local switch (the switch currently accessed by Telnet). If there are any problems, the Status column indicates an error condition. This command can require 60 seconds or more to provide information, depending upon the error rate specified in the threshold profile.

   c. Repeat Steps a and Step b for the rest of the switches in the group.

Table 8 lists which ports should be connected to each other by ISL cables.

Table 8. Cable Configuration for FC 6164

Color of Cable	Connect one end of cable to:	Connect other end of same cable to:
Lavender	SW 1 - PORT 8	SW 2-PORT 12
	SW 1 - PORT 9	SW 2-PORT 13
Yellow	SW 1 - PORT 10	SW 3 - PORT 12
	SW 1 - PORT 11	SW 3 - PORT 13
Blue	SW 1 - PORT 12	SW 4 - PORT 12
	SW 1 - PORT 13	SW 4 - PORT 13
Red	SW 1 - PORT 14	SW 5 - PORT 12
	SW 1 - PORT 15	SW 5 - PORT 13
Green	SW 6 - PORT 8	SW 5 - PORT 14
	SW 6 - PORT 9	SW 5 - PORT 15
Grey	SW 6 - PORT 10	SW 4 - PORT 14
	SW 6 - PORT 11	SW 4 - PORT 15
Orange	SW 6 - PORT 12	SW 3 - PORT 14
	SW 6 - PORT 13	SW 3 - PORT 15
Dark Blue	SW 6 - PORT 14	SW 2 - PORT 14
	SW 6 - PORT 15	SW 2 - PORT 15

Figure 24 provides the same information in graphical format.

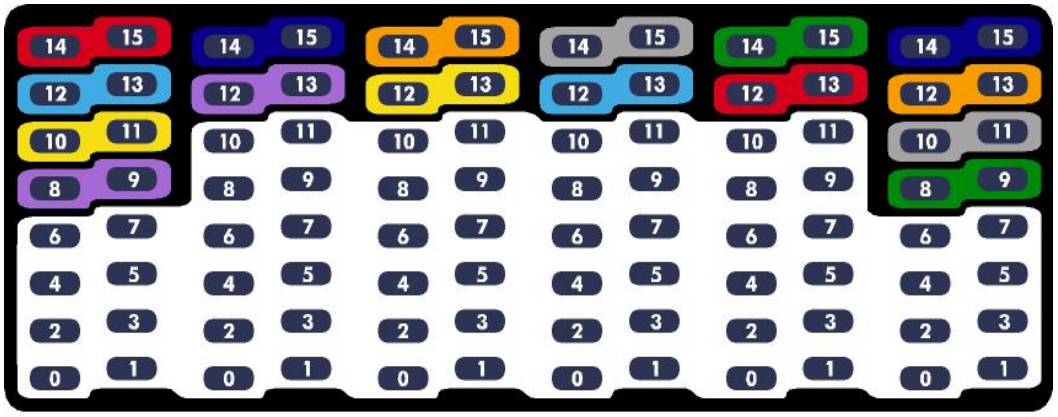


Figure 24. Color-coded ISL Cabling Diagram

This diagram is color-coded to indicate which ports should be connected to each other. Each pair of ports should be connected by the ISL cable to the other pair that is the same color in this diagram. For example, ports 8 and 9 on Switch 1 should be connected by the ISL cable to ports 12 and 13 on switch 2. The color coding also indicates the color of the labels on the ISL cables.

5

DIAGNOSTICS

Overview

The 2250 switch model is designed for maintenance-free operation, and contains self-diagnostic capabilities that provide switch status and operating statistics. In the case of a failure, the self-diagnostics aid in isolating the problem.

Each 2250 switch has the following loopback paths incorporated into the switch hardware:

- An internal loopback path test that checks internal Fibre Channel port logic functions, and the paths between the interfaces and central memory.
- An external loopback path test that checks installed fiber optic cables and port fault isolation in cross-port configurations, and also checks the main board, fixed media, and the GBIC module in each port. This test requires ports to be connected by external cables.

Diagnostic Tests

Diagnostic tests that can be run from a Telnet connection are listed in Table 9, along with the command required to initiate each test. See the *Fabric OS Reference Manual* for detailed information about the commands.

Table 9. Diagnostic Tests for the 2250 Switch

Test	Command	Description
Error Log	errDump	Displays the error log without page breaks.
Switch Offline	switchDisable	Sets the switch to the offline state necessary to run certain switch diagnostics.
Memory Test	ramTest	Checks CPU RAM memory. Can be run while switch is offline or online.
Port Register Test	portRegTest	Checks that the registers and static memory in each ASIC can be successfully accessed. Switch must be offline.
Central Memory Test	centralMemory Test	Checks that the central memory in each ASIC can be successfully accessed. Switch must be offline.
Control Message Interface (CMI) Conn Test	cmiTest	Verifies that control messages can be sent from ASIC to ASIC. Switch must be offline.
Content Addressable Memory (CAM) Test	camTest	Verifies CAM functionality. Switch must be offline.
Port Loopback Test	portLoopback Test	Checks all switch main board hardware. Frames transmitted are looped back and received. Switch must be offline.

Table 9. Diagnostic Tests for the 2250 Switch (continued)

Test	Command	Description
Cross Port Test	crossPortTest	Checks all switch paths. Frames transmitted by port M are looped back using external cable and received at port N. Switch must be offline.
Spin Silk Test	spinSilk	Checks all switch paths at the maximum speed of 1 Gbps. Frames transmitted by port M are looped back using external cables, and when received by port N are sent again by port M in an external loop. Switch must be offline.
SRAM Data Retention Test	sramRetention Test	Verifies that data written into ASIC memories is retained. Switch must be offline.
CMem Data Retention Test	CmemRetention Test	Verifies that data written into ASIC SRAMs is retained. Switch must be offline.
Switch Online	switchEnable	Returns switch to online state.

Error Messages

The error message log can be accessed through the Telnet command errDump. Note any messages before removing power from the switch, because error messages are stored in RAM and are lost when power is removed.

For a detailed description of each error message, see the *Fabric OS Reference Manual*.

6

INTRODUCING FABRIC MANAGER

Fabric Manager provides a graphical interface that allows the administrator to monitor and manage a fabric from a standard workstation. Fabric Manager can be used to manage fabrics containing the FC 6164 in addition to individual switches. The six switches in a FC 6164 are represented as a group.

Fabric Manager provides high-level information about all switches in the fabric, and launching the Web Tools application when more detailed information is required. The launching of Web Tools is transparent, providing a seamless user interface. In addition to the ability to view the switches in an FC 6164 as a group, Fabric Manager provides improved performance over Web Tools alone. If Web Tools is launched directly, rather than through Fabric Manager, the switches in the FC 6164 are represented as six individual switches.

Fabric Manager is installed on the workstation, and can be used to manage any switches that have Fabric OS v2.0 or later and Web Tools v2.2 or later installed (this documentation describes Web Tools v2.3 functionality). All switches in the fabric are represented in the main window of Fabric Manager.

In cooperation with Web Tools, Fabric Manager provides the following information and capabilities:

- monitoring and management of the entire fabric:
  - status of all switches in the fabric
  - access to event logs for entire fabric
  - zoning functions
  - loop diagnostics and query and control of loop interfaces to aid in locating faulty devices
  - ability to name and zone QuickLoops
  - access to the name server table
  - Telnet functions
  - switch beaconing for rapid identification in large fabric environments
- aggregate monitoring and management of all six switches in an FC 6164:
  - aggregate status of the switches in the group
  - access to detailed information for each switch in the group
- monitoring and management of individual switches in the fabric:
  - summary information about each switch
  - access to event logs for individual switches
  - switch configuration and administration
  - ability to upgrade Fabric OS and license key administration
  - report capability for switch configuration information
- monitoring and management of individual ports:
  - port status
  - information about GBIC (gigabit interface converter) serial IDs

- information about connected devices
- loop information
- port performance including frame counts (frames in, frames out) and error counts

Views Available in Fabric Manager

Fabric Manager provides information about and access to the fabric through a series of separate windows, making it possible to view several aspects of the fabric at the same time. Following is a summary of the views available in Fabric Manager.

Table 10.

Initial Display When Fabric Manager is Connected to the Fabric:	
Fabric View	Includes a control panel that provides access to fabric-wide options, a panel for each switch in the fabric, plus a legend that explains the meaning of the background colors on the Switch icons. Each panel contains an icon that represents the switch or integrated fabric, in addition to icons for Switch Events and the Administrative and Telnet interfaces. The background color of the switch icon represents the status of that particular switch or integrated fabric (as defined by the legend provided in the window). Fabric View also provides access to fabric-wide options such as zoning. **Note** Switch status is calculated approximately once per second; however the initial calculation does not occur until 30 to 60 seconds after the switch is booted. For all statuses that are based on errors per time interval, any errors cause the status to show faulty until the entire sample interval has passed.

Table 10. (continued)

Accessible from Fabric View:	
Fabric Events View	Displays the error log for the fabric, which is the combination of the error logs of all the switches in the fabric. Accessed by clicking Fabric Events on the control panel.
Fabric Topology View	Displays physical configuration, including active domains, paths, and routing information. Accessed by clicking Fabric Topology on the control panel.
Name Server Table View	Displays the name server table for the fabric. Use to view information about the devices attached to the fabric. Accessed by clicking Name Server on the control panel.
Zone Administration View	Provides an interface to Zoning, including zone settings, zone aliases, QuickLoops, and zone configurations. Accessed by clicking Zone Admin on the control panel.
Fabric Log	Provides a record of system events and error messages.
Summary View/Detail View	Toggles between summarized and detailed versions of Fabric View.
FC 6164 Integrated Fabric View	Displays an icon for each switch in the integrated fabric, with status of each switch indicated by the background color of the corresponding icon. The detailed information provided corresponds to the switch that is currently selected. This panel is accessed from Fabric View by clicking on a switch in a FC 6164 switch panel. When the Integrated Fabric View is launched, Switch Views for the individual switches in the integrated fabric can be accessed by clicking on the individual Switch icons in the Integrated Fabric View.

Table 10. (continued)

Switch View	Displays information about individual switches, including a real-time view of switch status. Accessed by clicking a Switch icon in the FC 6164 Switch View or in Fabric View. The Switch View is also the launch point for the Switch Events View, Telnet Interface, Fabric Watch View, Administrative Interface, Performance View, and Port Information View, and includes icons that display the status of the switch fans, temperature monitors, and beacon.
Switch Events View	Displays the error log for the switch. Accessed by clicking Events on the switch panel. This view can also be accessed through Switch View (see "Switch Events View" on page 86).
Telnet Interface	Provides an interface for using Telnet commands for switch diagnostics, troubleshooting, and fabric management. Accessed by clicking Telnet on the switch panel. This view can also be accessed through Switch View (see "Telnet Interface" on page 86).
Administrative Interface	Provides an interface for performing functions such as upgrading firmware versions or reconfiguring a switch. Accessed by clicking Admin on the switch panel. This view can also be accessed through Switch View (see "Administrative Interface" on page 86).
Accessible from FC 6164 View:	
FC 6164 Individual Switch View	Displays information about an individual switch in the FC 6164, including a real-time view of switch status. Accessed by clicking Switch in the FC 6164. This view is also the launch point for the Switch Events View, Telnet Interface, Fabric Watch View, Administrative Interface, Performance View, and Port Information View, and includes icons that display the status of the switch fans, temperature monitors, and beacon.

Table 10. (continued)

Accessible from Switch View:	
Port Information View	Displays statistics and status for the selected port, GBIC, or loop. Also provides options for managing loops. Accessed by clicking the icon for the relevant port in Switch View.
Power Supply Status	The Power Supply icons on the switch graphic indicate the number of power supplies present, and the LED on the power supply indicates the status of the power assemblies.
Switch Events View	Displays the error log for the switch. Accessed by clicking Events in Switch View. This view can also be accessed through Fabric View (see "Fabric View" on page 83).
Telnet Interface	Provides an interface for using Telnet commands for switch diagnostics, troubleshooting, and detailed fabric management. Accessed by clicking Telnet in Switch View. This view can also be accessed through Fabric View (see "Fabric View" on page 83).
Fabric Watch View	Monitors fabric elements and displays error and performance counter status, issuing an alert when conditions are out of acceptable ranges. Accessed by clicking Watch in Switch View.
Fan Icon	The color of this icon indicates the overall status of the fans (see the color legend in Fabric View).
Administrative Interface	Provides an interface for performing functions such as upgrading firmware versions or reconfiguring a switch. Accessed by clicking Admin in Switch View. This view can also be accessed through Fabric View (see "Fabric View" on page 83).
Performance View	Graphically portrays real-time data throughput for each port and displays total switch bandwidth utilization. Accessed by clicking Perf in Switch View.

Table 10. (continued)

Beacon Icon	Click to turn the beacon, which is an indicator light on the front panel of the switch, on or off. Appearance of icon indicates whether beacon is lit.
Temperature Icon	The color of this icon indicates the overall temperature status (see the color legend in Fabric View).

7

INSTALLING FABRIC MANAGER

Requirements

The computer workstation and the switch must both meet specific requirements for the correct installation and operation of Fabric Manager.

Switch Requirements

Fabric Manager can be used to manage switches that meet the following requirements:

- SilkWorm 2400, 2800.
- Fabric OS a2.4.1 or later versions of HP supported Fabric OS. Fabric Manager can be used to manage switches with earlier versions, but status and event information is not available.
- HP Surestore FC Switch 6164

Workstation Requirements

The following items are required for the correct installation and operation of Fabric Manager on the computer workstation:

- one of the following operating systems:
  - Windows 2000
  - Windows NT 4.0
- adequate RAM:
  - 128 MB for fabrics of 21 switches or less
  - 256 MB for fabrics containing more than 21 switches
- 10 MB of free disk space
- one of the following web browsers:
  - Netscape Communicator 4.51 or later
  - Internet Explorer 4.01 or later

Note The browser must be specifically configured to work with Fabric Manager. For information about how to do this, see "Configuring the Web Browser" on page 91.

- Java™ Plug-in version 1.2.2-007 or later

Installing Fabric Manager

Preparing to use Fabric Manager to manage your fabric requires the following steps:

- installation of one of the supported web browsers on the workstation, if not already installed
- configuration of the web browser for use with Fabric Manager
- installation of the required Java Plug-in on the workstation, if not already installed
- installation of Fabric Manager on the computer to be used as a workstation

Installing a Web Browser

Install one of the following browsers, if not already installed:

- Netscape Communicator 4.51 or later (available at http://www.netscape.com)
- Internet Explorer 4.01 or later (available at http://www.microsoft.com)

Configuring the Web Browser

Specific browser settings are required for the correct operation of Fabric Manager with either Netscape Communicator or Internet Explorer.

Configuring Netscape Communicator

The web browser cache must be cleared after the installation of Fabric OS. The browser can use local cache copies of jar files and image files to improve performance (depending on options selected in the browser), which can cause incorrect display.

To remove cached files from Netscape Communicator:

1. Select Edit > Preferences.
2. Click Advanced in the left text box to expand it, then click Cache.
3. On the Cache panel, click Clear Memory Cache.

4. Click Clear Disk Cache.
5. Click OK.
6. Exit and relaunch the browser.

Configuring Internet Explorer

Correct operation of Fabric Manager with Internet Explorer requires clearing the web browser cache after installation, and specifying the appropriate settings for the browser refresh frequency and process model.

The browser cache must be cleared after the installation of Fabric OS. The browser can use local cache copies of jar files and image files to improve performance (depending on options selected in the browser), which can cause incorrect display.

To remove cached files from Internet Explorer:

1. Select Internet Options from the View menu if using Internet Explorer 4.x, or from the Tools menu if using 5.x.
2. Select the General tab.
3. Click Delete Files... (under “Temporary Internet Files”).
4. Click OK.
5. Exit and relaunch the browser.

Browser pages must be refreshed at every visit to ensure the correct operation of the Switch Admin feature.

To set the refresh frequency:

1. Select Internet Options from the View menu if using Internet Explorer 4.x, or from the Tools menu if using 5.x.
2. Select the General tab and click Settings (under “Temporary Internet Files”).
3. Under “Check for newer versions of stored pages,” select “Every visit to the page.”

The correct Browser Process Model must be selected.

To select the Browser Process Model (only required for Windows NT):

1. Select View > Internet Options if using Internet Explorer 4.x, or Tools > Internet Options if using Internet Explorer 5.x.
2. Select the Advanced tab and click to expand the Browsing category.
3. Under "Browsing," select "Browse in a new process" if using Internet Explorer 4.x, or "Launch browser windows in a separate process" if using Internet Explorer 5.x.

Installing the Java Plug-in on the Workstation

A Java Plug-in must be installed on the workstation for the Fabric Manager installer to function, in addition to the correct operation of Fabric Manager and Web Tools. Windows 2000 and NT workstations require Java Plug-in version 1.2.2-007.

To determine the version of the Java Plug-in installed on Windows 2000 or NT, and install the plug-in if necessary:

1. Launch the Java Plug-in control panel by selecting Start > Programs > Java Plug-in Control Panel and turning on the Java console.
2. Launch the web browser, enter the name or IP address of a switch running Fabric OS a2.4.1 or later, and press Enter.

   The switch launches the Java Plug-in console, which displays the Java Plug-in version currently installed.
3. Determine whether the correct Java Plug-in version is installed, and install if necessary:
   - If the correct version is installed, Fabric Manager is ready for use.
   - If no Java Plug-in is installed, point the browser towards a switch running Fabric OS a2.4.1 or later, follow the link to the Sun Microsystems website, and download the correct Java Plug-in, then double-click the downloaded file to install the plug-in.
   - If an outdated version is currently installed, uninstall it, relaunch the browser, enter the address of a switch running Fabric OS a2.4.1 or later, follow the link to the Sun website, and download the new Java Plug-in.

Installing Fabric Manager on the Workstation

The Fabric Manager 1.0 installation package includes the following items:

- ReadMe.txt file, providing product name, version, and late-breaking news
- Java Plug-in version 1.2.2-007
- FabricManager.Jar file, containing the required Java classes
- FabricManager.Properties file, containing configuration information

To install Fabric Manager 1.0:

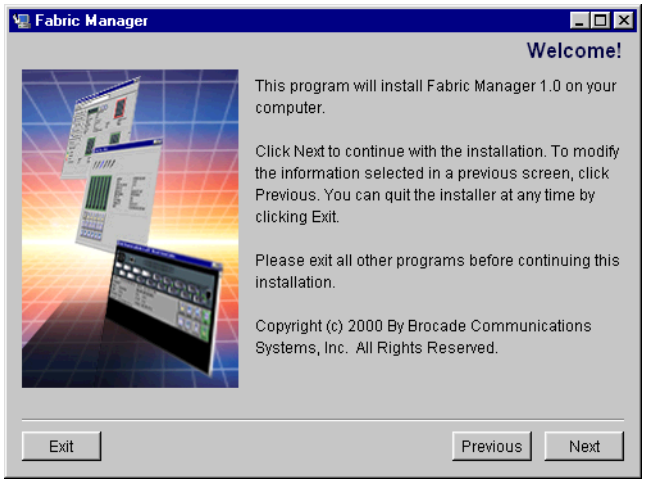
1. Insert the Fabric Manager 1.0 CD-ROM in the CD drive of the computer workstation.

   The installer automatically launches.

   If Fabric Manager is already installed on the computer, a window displays to indicate this. If this window displays, you can either exit the installer and uninstall the existing version, or click Next to continue with the installation.

   Note If you decide to continue with the installation and select the same location, all existing files are overwritten, except for the FabricManager.Properties file, which contains the selections from the previous installation, and is saved as FabricManager.Properties.old.

The Welcome window displays, providing product information and version.


Fabric Manager
Welcome!
This program will install Fabric Manager 1.0 on your computer.
Click Next to continue with the installation. To modify the information selected in a previous screen, click Previous. You can quit the installer at any time by clicking Exit.
Please exit all other programs before continuing this installation.
Copyright (c) 2000 By Brocade Communications Systems, Inc. All Rights Reserved.
Exit
Previous
Next

2. Click Next.

   After the Welcome window is dismissed, the installer searches the local system for the correct version of the Java Plug-in. If this version is not installed, a window displays warning that the correct version of the plug-in is missing. If the installer warns that the plug-in is missing, perform Step 3 before continuing. Otherwise, continue with Step 4.

3. If the installer warns that the Java plug-in is missing:

   a. Click Exit to close the Fabric Manager installer, then click Exit Install in the warning dialog that displays.

   b. View the local drives, right-click on the icon for the Fabric Manager CD-ROM, and select Explore.

   c. Click to open the JRE folder, then click the file jre-1_2_2_007-win.exe.

      The plug-in installer launches.

   d. Read the license agreement, and click Next if you accept the agreement.

      A window displays to allow selection of the installation location.

e. Click Next to accept the default installation location, or browse for a custom location and then click Next.

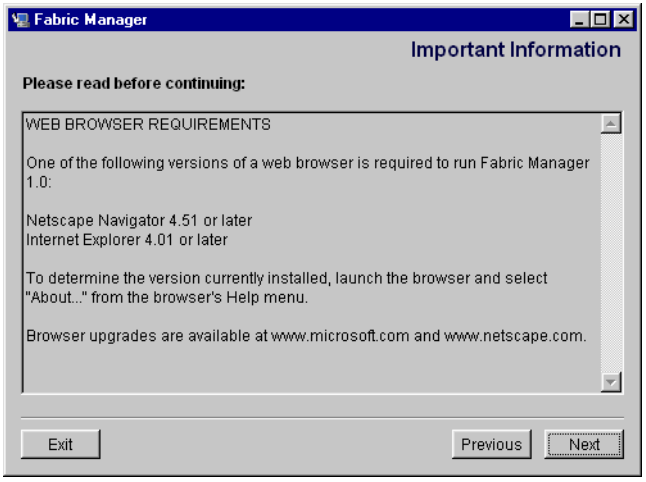
   The installation completes and the plug-in installer window closes.

f. Relaunch the Fabric Manager installer by double-clicking the icon for your CD-ROM drive.

   The Welcome window displays again.

g. Click Next to dismiss the Welcome window.

When the Java plug-in has been successfully located, a window listing Fabric Manager's web browser requirements displays.


Fabric Manager
Important Information
Please read before continuing:
WEB BROWSER REQUIREMENTS
One of the following versions of a web browser is required to run Fabric Manager 1.0:
Netscape Navigator 4.51 or later
Internet Explorer 4.01 or later
To determine the version currently installed, launch the browser and select "About..." from the browser's Help menu.
Browser upgrades are available at www.microsoft.com and www.netscape.com.
Exit
Previous
Next

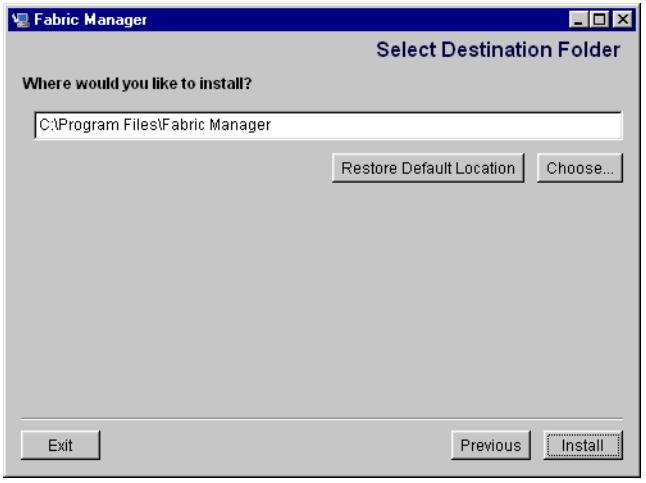
4. Determine whether a compatible browser is installed. If a compatible browser is not installed, exit the Fabric Manager installation, install the browser, and then relaunch the Fabric Manager installation.

Note The browser should be installed before Fabric Manager is installed so that the pathname for the browser can be written to the Fabric Manager properties file.

---

5. Click Next to continue.

   A window that allows selection of the installation location displays.



6. Select the preferred location for the installation.
   - To select the default location, click **Next**.
   - To select another location:
     a. Click **Choose**.
     b. Select a location from the browser window that displays, and click **OK**.
     c. Click **Next** in the Select Destination Folder window.
7. Click Install to accept the default installation location, or browse for a custom location.

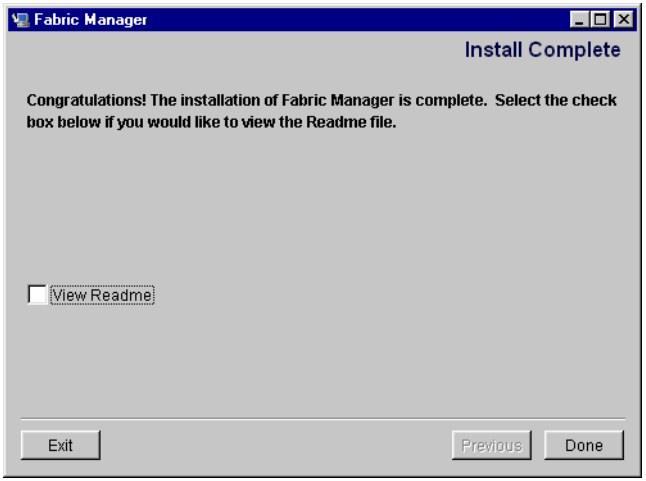
   When Install is clicked, a window showing the progress of the installation displays, with the name of the file currently being installed in the lower portion of the window.

   The installer searches the registry for the web browser and adds the complete pathname to the FabricManager.Properties file. If the installer is unable to locate a web browser, a window displays warning that no browser was found. If this window displays, exit the Fabric Manager

installation, install the browser, and then relaunch the Fabric Manager installation.

Note If the browser is installed or moved after Fabric Manager is installed, see "Adding the Browser Pathname to the Properties File" on page 100.

When the installation of Fabric Manager is complete, the following window displays:


Fabric Manager
Install Complete
Congratulations! The installation of Fabric Manager is complete. Select the check box below if you would like to view the Readme file.
View Readme
Exit
Previous
Done

8. Check the checkbox if you want to view the ReadMe file, then click Done to close the installer.

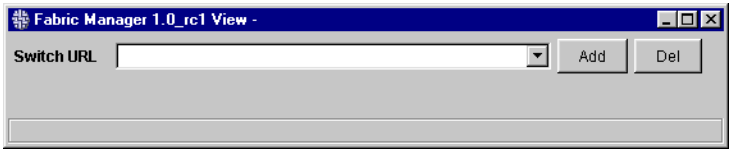
Note Clicking Exit at this point does not undo the installation, but does prevent the ReadMe file from being displayed.

Launching Fabric Manager

To launch Fabric Manager:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.



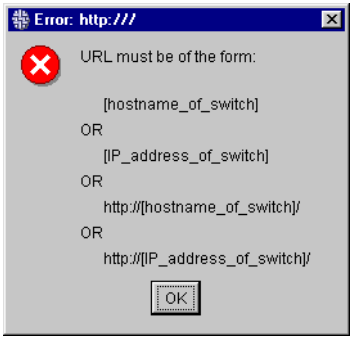
2. Enter the switch name or IP address in the Switch URL field.

Note This switch is assumed to be the local domain. If you want information specific to QuickLoop to be available, the QuickLoop switch must be the local domain.

---

3. If you want to add the address entered in the field to the drop-down list, click Add. To remove an address from the drop-down list, select that address and click Del.
4. Press Enter to submit the address.

Note If an incorrect address or format is used, an error message displays, listing the formats that can be used. If this message displays, determine and enter the correct address.



When a correct address is entered, Fabric Manager launches, displaying the default view, Fabric View. For more information about using Fabric Manager, see Chapter 8, “Using Fabric Manager”.

Adding the Browser Pathname to the Properties File

If the browser is installed after Fabric Manager is installed, the properties file must be edited to show the correct path for the browser.

Note Editing any information other than the browser pathname in the properties file is not recommended.

To add the browser pathname to the properties file:

1. Open the directory where Fabric Manager is installed. The default directory is c:\Program Files\Fabric Manager\, where “c” is the local drive.
2. Double-click the FabricManager.Properties file, and select a text editor (such as Notepad) as the application for this file.

3. Enter a new line starting with “BrowserPath=”, followed by the correct pathname for the browser, in quotes. For example:

   BrowserPath=“C\:\\Program Files\\Internet Explorer\\iexplore.exe”

   This line can be added anywhere in the file, provided it does not interrupt another line.

Uninstalling Fabric Manager

Note The uninstaller can only access the most recent installation. To uninstall an additional installation, open the corresponding installation folder, open the subdirectory UninstallerData, and double-click Uninstall FabricManager.exe to launch the uninstaller.

To uninstall Fabric Manager:

1. Select Start > Settings > Control Panel.
2. Double-click the Add/Remove control panel.
3. On the Install/Uninstall tab of the control panel, select Fabric Manager and click Add/Remove.

   A window displays warning that you are about to uninstall Fabric Manager.
4. Click Uninstall to continue.

   A window showing the progress of the uninstallation displays. When the uninstallation is complete, the Uninstall Complete window displays.
5. Click Exit to close the Uninstall Complete window.

8

USING FABRIC MANAGER

Note Switches can be accessed simultaneously from different connections and by different methods, such as the Front Panel of the switch, Telnet, SNMP, and through Web Tools. To ensure that any modifications are correctly applied, verify that the switch is not being modified from any other connection at the same time.

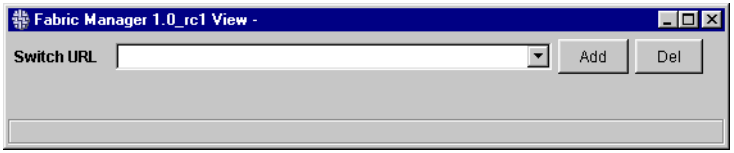
Fabric View

Fabric View is the first view that displays when you connect to a switch, and provides access to specific information about the switches in the fabric through a panel representing each switch. Fabric View also provides a control panel containing additional options, and a legend explaining the colors that are used to indicate status on the switch panels.

To launch Fabric Manager and access Fabric View:

1. Select Start > Programs > Fabric Manager > Fabric Manager.

   The URL window displays.



2. Enter the switch name or IP address in the blank field.

Note This switch is assumed to be the local domain.

---

3. If you want to add the address entered in the field to the drop-down list, click Add. To remove an address from the drop-down list, select that address and click Del.
4. Press the Enter key to submit the address.

Note If an incorrect address or format is used, an error message displays, listing the formats that can be used. If this message displays, determine and enter the correct address.

Fabric Manager launches, displaying the default view, Fabric View.

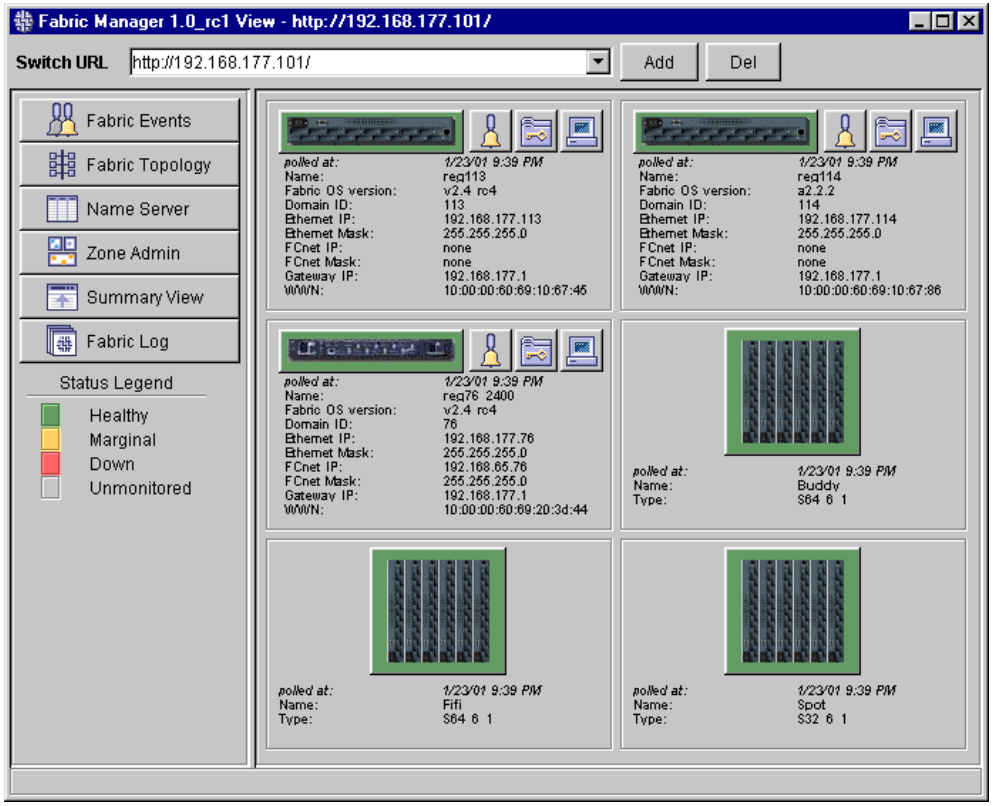


Table 11 describes the items visible in Fabric View.

Table 11.

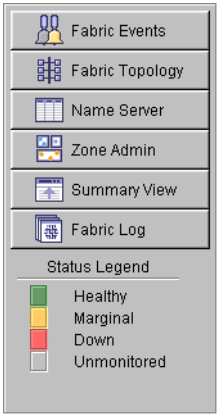
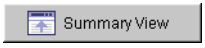
Control Panel 	Provides access to a number of fabric-wide features (described in the following rows) and includes a legend for interpreting the background color of the Switch icons. The components of the control panel are described in the following rows.
Fabric Events Button 	Click to open Fabric Events View. For information about this view, see “Fabric Events View” on page 110.
Fabric Topology Button 	Click to open Fabric Topology View. For information about this view, see “Fabric Topology View” on page 111.
Name Server Button 	Click to open Name Server Table View. For information about this view, see “Name Server Table View” on page 114.
Zone Admin Button 	Click to open Zone Administration View. For information about this view, see “Zone Administration View” on page 117.
Summary/Detail View Button 	Toggle to view Fabric View in either Summary or Detail format. The Summary format shows abbreviated switch panels (see Figure 25). The default view is Detail.
Fabric Log Button 	Click to view the messages in the Fabric Manager log. For information about this view, see “Fabric Manager Log” on page 126.

Table 11. (continued)

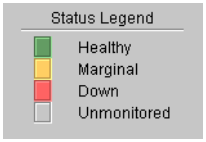
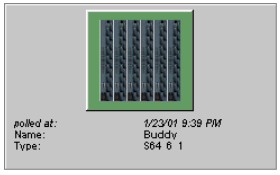
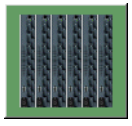
Status Legend 	Defines meaning of colors visible in the background of the switch icons. Each color indicates a different operational state: • Green Healthy • Yellow Marginal (mix of good and faulty readings) • Red Down (more than two faulty readings) • Gray Unknown or unmonitored If no data is available from a switch, the most recent background color remains displayed. **Note** For all statuses that are based on errors per time interval, any errors cause the status to show faulty until the entire sample interval has passed.
FC 6164 Panel 	The Switch Panel representing a FC 6164. The components of the control panel are described in the following rows.
FC 6164 Icon 	Click to open Group View for the FC 6164. The background color around the icon indicates the overall status of the integrated fabric (for information about this view, see "Switch View for Individual Switches" on page 129).
polled at: (or *unreachable since:*)	Time of the last status check. If the switch is unavailable, this shows the time of the last successful status check.
Name:	The name of the switch.

Table 11. (continued)

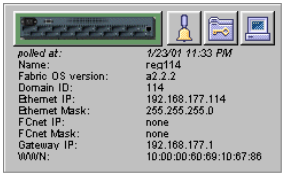
Type:	Type of FC 6164 configuration. Default is FC6164.
Individual Switch Panel 	The Switch Panel representing an individual switch in the fabric. A Switch Panel displays for each individual switch in the fabric. It also displays if an individual switch in the FC 6164 Switch View is double-clicked.
Individual Switch Icon	Click to open Switch View for the switch. Each switch type is represented by a different icon. The background color around the icon indicates the status of the switch (for information about this view, see "Switch View for Individual Switches" on page 129).
Events	Click to open Switch Events View to display the Switch Events log (for information about this view, see "Switch Events View" on page 133).
Admin	Click to open Switch Administration View (for information about this view, see "Administrative Interface" on page 159).
Telnet	Click to launch the Telnet Interface for the switch (for information about this view, see "Telnet Interface" on page 179).
polled at: (or *unreachable since:*)	Time of the last status check. If the switch is unavailable, this shows the time of the last successful status check.
Name:	The name of the switch.
Fabric OS version:	Version of Fabric OS installed on the switch.
Domain ID:	A number that uniquely identifies the switch within the fabric.
Ethernet IP:	Ethernet IP address.

Table 11. (continued)

Ethernet Mask:	Ethernet subnetmask.
FCnet IP:	Fibre channel IP address.
FCnet Mask:	Fibre channel subnetmask.
Gateway IP:	Gateway IP address.
WWN:	Unique numeric identifier for the switch; assigned by manufacturer.

Figure 25 shows Fabric View in Summary format.

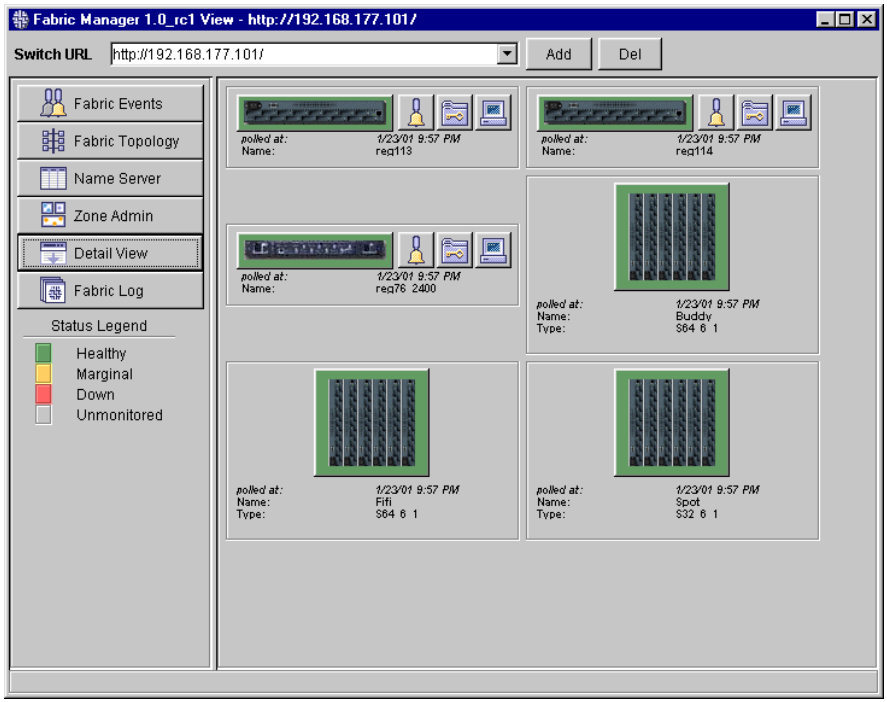


Figure 25. Fabric View in Summary Format

Fabric Events View

Fabric Events View provides a log of events for all switches in the fabric.

To access Fabric Events View:

1. Select Start > Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

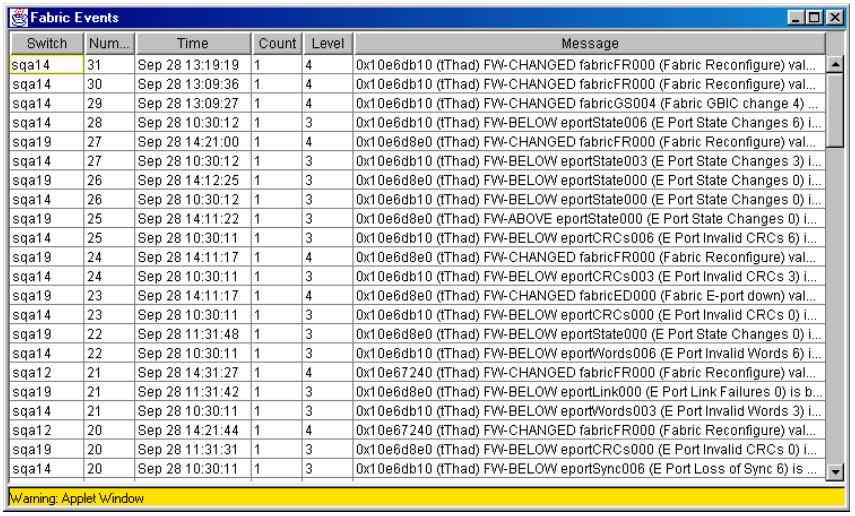
   Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

   Fabric Manager launches, displaying the default view, Fabric View.

4. From Fabric View, click Fabric Events.

   Fabric Events View displays.


Fabric Events
Switch | Num... | Time | Count | Level | Message
sqa14 | 31 | Sep 28 13:19:19 | 1 | 4 | 0x10e6db10 (tThad) FW-CHANGED fabricFR000 (Fabric Reconfigure) val...
sqa14 | 30 | Sep 28 13:09:36 | 1 | 4 | 0x10e6db10 (tThad) FW-CHANGED fabricFR000 (Fabric Reconfigure) val...
sqa14 | 29 | Sep 28 13:09:27 | 1 | 4 | 0x10e6db10 (tThad) FW-CHANGED fabricGS004 (Fabric GBIC change 4) ...
sqa14 | 28 | Sep 28 10:30:12 | 1 | 3 | 0x10e6db10 (tThad) FW-BELOW eportState006 (E Port State Changes 6) i...
sqa19 | 27 | Sep 28 14:21:00 | 1 | 4 | 0x10e6d8e0 (tThad) FW-CHANGED fabricFR000 (Fabric Reconfigure) val...
sqa14 | 27 | Sep 28 10:30:12 | 1 | 3 | 0x10e6db10 (tThad) FW-BELOW eportState003 (E Port State Changes 3) i...
sqa19 | 26 | Sep 28 14:12:25 | 1 | 3 | 0x10e6d8e0 (tThad) FW-BELOW eportState000 (E Port State Changes 0) i...
sqa14 | 26 | Sep 28 10:30:12 | 1 | 3 | 0x10e6db10 (tThad) FW-BELOW eportState000 (E Port State Changes 0) i...
sqa19 | 25 | Sep 28 14:11:22 | 1 | 3 | 0x10e6d8e0 (tThad) FW-ABOVE eportState000 (E Port State Changes 0) i...
sqa14 | 25 | Sep 28 10:30:11 | 1 | 3 | 0x10e6db10 (tThad) FW-BELOW eportCRCs006 (E Port Invalid CRCs 6) i...
sqa19 | 24 | Sep 28 14:11:17 | 1 | 4 | 0x10e6d8e0 (tThad) FW-CHANGED fabricFR000 (Fabric Reconfigure) val...
sqa14 | 24 | Sep 28 10:30:11 | 1 | 3 | 0x10e6db10 (tThad) FW-BELOW eportCRCs003 (E Port Invalid CRCs 3) i...
sqa19 | 23 | Sep 28 14:11:17 | 1 | 4 | 0x10e6d8e0 (tThad) FW-CHANGED fabricED000 (Fabric E-port down) val...
sqa14 | 23 | Sep 28 10:30:11 | 1 | 3 | 0x10e6db10 (tThad) FW-BELOW eportCRCs000 (E Port Invalid CRCs 0) i...
sqa19 | 22 | Sep 28 11:31:48 | 1 | 3 | 0x10e6d8e0 (tThad) FW-BELOW eportState000 (E Port State Changes 0) i...
sqa14 | 22 | Sep 28 10:30:11 | 1 | 3 | 0x10e6db10 (tThad) FW-BELOW eportWords006 (E Port Invalid Words 6) i...
sqa12 | 21 | Sep 28 14:31:27 | 1 | 4 | 0x10e67240 (tThad) FW-CHANGED fabricFR000 (Fabric Reconfigure) val...
sqa19 | 21 | Sep 28 11:31:42 | 1 | 3 | 0x10e6d8e0 (tThad) FW-BELOW eportLink000 (E Port Link Failures 0) is b...
sqa14 | 21 | Sep 28 10:30:11 | 1 | 3 | 0x10e6db10 (tThad) FW-BELOW eportWords003 (E Port Invalid Words 3) i...
sqa12 | 20 | Sep 28 14:21:44 | 1 | 4 | 0x10e67240 (tThad) FW-CHANGED fabricFR000 (Fabric Reconfigure) val...
sqa19 | 20 | Sep 28 11:31:31 | 1 | 3 | 0x10e6d8e0 (tThad) FW-BELOW eportCRCs000 (E Port Invalid CRCs 0) i...
sqa14 | 20 | Sep 28 10:30:11 | 1 | 3 | 0x10e6db10 (tThad) FW-BELOW eportSync006 (E Port Loss of Sync 6) is ...
Warning: Applet Window

To sort the events by a particular column, click the column header. To resize a column, drag the column divider.

Table 12 describes the columns in the Fabric Events view:

Table 12.

Switch	Name of switch.
Num... (number)	Event number for affected switch.
Time	Time of event.
Count	Number of consecutive occurrences of same event.
Level	Severity level of event: 0 panic (switch reboots) 1 critical 2 error 3 warning 4 information 5 debug
Message	Description of event.

Fabric Topology View

Fabric Topology View summarizes the physical configuration of the fabric from the perspective of the "local domain," which is the domain of the switch entered as a URL in the web browser. This includes information about the "destination domains," which are all other domains in the fabric, and the paths between each destination domain and the local domain.

To access Fabric Topology View:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

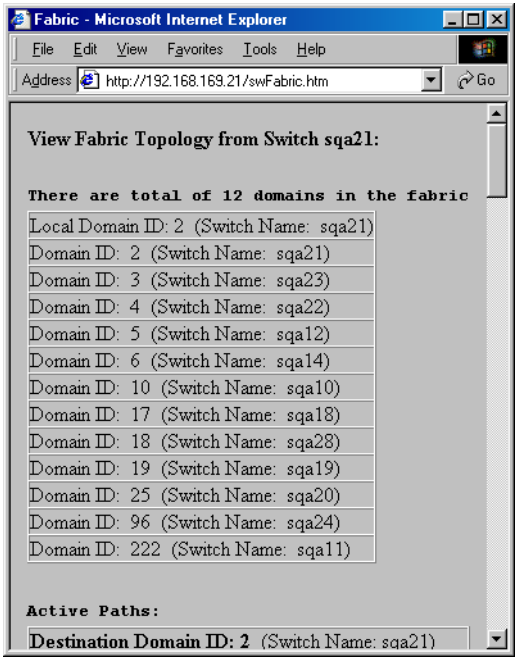
   Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

   Fabric Manager launches, displaying the default view, Fabric View.

4. From Fabric View, click Fabric Topology.

   Fabric Topology View displays.


Fabric - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.168.169.21/swFabric.htm
Go
View Fabric Topology from Switch sqa21:
There are total of 12 domains in the fabric
Local Domain ID: 2 (Switch Name: sqa21)
Domain ID: 2 (Switch Name: sqa21)
Domain ID: 3 (Switch Name: sqa23)
Domain ID: 4 (Switch Name: sqa22)
Domain ID: 5 (Switch Name: sqa12)
Domain ID: 6 (Switch Name: sqa14)
Domain ID: 10 (Switch Name: sqa10)
Domain ID: 17 (Switch Name: sqa18)
Domain ID: 18 (Switch Name: sqa28)
Domain ID: 19 (Switch Name: sqa19)
Domain ID: 25 (Switch Name: sqa20)
Domain ID: 96 (Switch Name: sqa24)
Domain ID: 222 (Switch Name: sqa11)
Active Paths:
Destination Domain ID: 2 (Switch Name: sqa21)

   The window can be scrolled down to display information about the individual paths between the local switch and each of the other switches in the fabric.

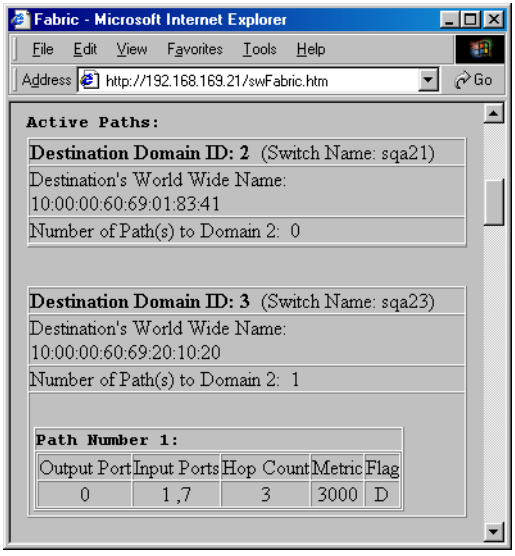


Table 13 describes the fields in Fabric Topology View.

Table 13.

View Fabric Topology from Switch [switch name]:	Lists the switch in the domain that is assumed to be the local domain.
There are a total of [n] domains in the fabric.	The number of domains in the fabric.
Local domain ID:	A number that uniquely identifies the local switch within the fabric, and the name of the switch.
Domain ID: (may be more than one)	A number that uniquely identifies the switch within the fabric, and the name of the switch.
Active Paths:	This line is followed by information about each destination domain, including information about each of the paths between that domain and the local domain.

Table 13. (continued)

Destination Domain ID:	The ID of the destination domain that is described in the lines following the ID. This information and the two lines following it display for each destination domain in the fabric.
Destination's Worldwide Name:	The WWN of the destination domain.
Number of Paths:	The number of active paths between the destination domain and the local domain.
Path Number:	The number assigned to the specific path described in the table that follows this information. This information and the following table display for each path for which the domain described above is the destination.
Output Ports	The number of output ports on the path between the destination domain and the local domain.
Input Ports	The number of input ports on the path between the destination domain and the local domain.
Hop Count	The number of hops (interswitch links) between the local domain and the destination domain.
Metric	Metrics for traffic flow along the path.
Flag	The flag assigned to the path.

Name Server Table View

Name Server Table View provides the name server entries listed in the Simple Name Server database. This includes all name server entries for the fabric, not only those related to the local domain. Each row in the table represents a different device.

To access Name Server Table View:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

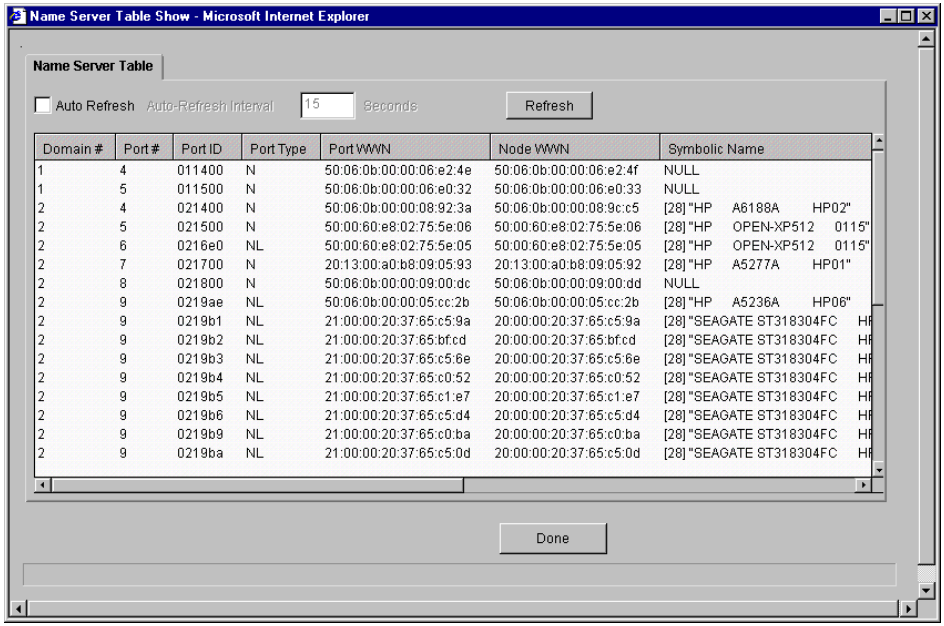
Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

   Fabric Manager launches, displaying the default view, Fabric View.

4. From Fabric View, click Name Server.

   Name Server Table View displays.



Note To sort the events by a particular column, click the column header. To resize a column, drag the column divider.

The following fields are included in the Name Server Table:

Auto Refresh	Check to enable Auto Refresh or uncheck to disable.
Auto Refresh Interval	If Auto Refresh is checked, enter the number of seconds for the refresh interval.
Refresh	Click to refresh the window immediately.
Done	Click to close the window.

The Name Server Table also includes the following columns:

Domain #	The domain ID of the switch to which the device is connected.
Port #	The number of the switch port to which the device is connected.
Port ID	The port ID of the device (24-bit hexadecimal value).
Port Type	The port type of the device (N for fabric direct attached port, or NL for fabric direct attached loop port).
Port WWN	The worldwide name of the device port.
Node WWN	The worldwide name of the device node.
Symbolic Name	The symbolic name of the device assigned through the SCSI INQUIRY command.
FC4 Types	The fibre channel FC4 layer types supported by the device, such as IP or FCP.
COS	The fibre channel classes of service supported by the device.
Fabric Port Name	The name of the fabric port in use by the device.
Port IP Address	The IP address of the fabric port.

Hard Address	The hard address of the fabric port.
Member of Zones	The zones to which this device belongs. This column does not update when the table is refreshed. To view updated zoning information, close and re-open the Name Server Table.

Zone Administration View

Zone Administration View provides access to all the zoning functions, and can only be accessed using an administrative account. This view is not updated when it is launched; if a switch or device is added or removed from the network, it is necessary to save the changes and relaunch the Zone Administration View for the changes to take effect. For more information about using Zoning, see the *Zoning User's Guide*.

To access Zone Administration View:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

   Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

   Fabric Manager launches, displaying the default view, Fabric View.

4. From Fabric View, click Zone Admin.

   Zone Administration View displays (see Figure 26).

Following are the tabs provided in Zone Administration View and the pages on which they are described:

- "Alias Tab" on page 118
- "Zone Tab" on page 120
- "QuickLoop Tab" on page 122
- "Config Tab" on page 124

Alias Tab

You can use the Alias tab to create and manage aliases for devices in the fabric.

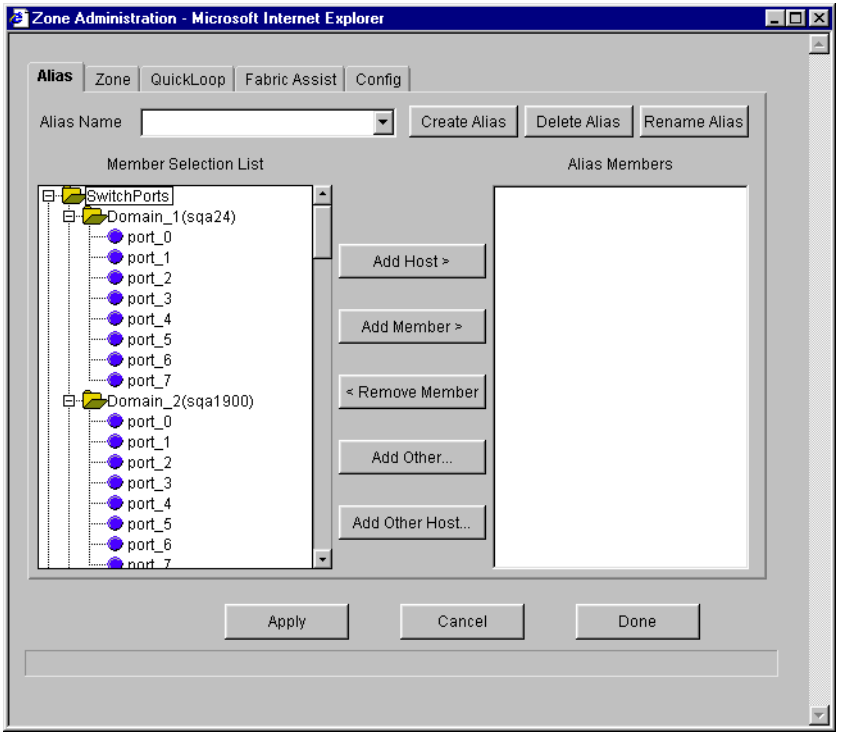


Figure 26. Alias Tab in Zone Administration View

Following is a description of the fields on the Alias tab:

Alias Name	To modify an existing alias, select an alias name.
Create Alias	Click to create a new alias. A dialog displays in which you can enter the name of the new alias. All names must be unique and contain no spaces.
Delete Alias	Click to delete the alias selected in the Alias Name field. Deleting an alias automatically removes it from all zones.

Rename Alias	Click to rename the alias selected in the Alias Name field. A dialog displays in which you can edit the alias name. Renaming an alias automatically renames it in all zones.
Member Selection List	A list of potential alias members, including switches, ports, WWNs, and QuickLoop AL_PAs.
Add Member	Click to add the item selected in the Member Selection List to the Alias Members list. You can add individual ports or an entire switch. If a switch is added, all ports on the switch are added. To add a device WWN, select either a node WWN (folder icon) or port WWN (blue circle icon) from the WWN sub-tree.
Remove Member	Click to remove the selected member selected from the [Alias name] Members list.
Add Other	Click to add a WWN, switch port, QuickLoop, or AL_PA that is not available in the Member Selection List.
Alias Members	The member list of the alias selected in the Alias Name field. The name of this list depends on the name of the selected alias. If no alias is selected, the name displays as “null Members.”
Apply	Click to apply all changes made since Zone Administration View was opened, including changes made on other tabs in the view. Changes cannot be cancelled after they are applied.
Cancel	Click to cancel all changes made since changes were last applied, and to exit Zone Administration View. Changes cannot be cancelled after they are applied.
Done	Click to apply all changes made since Zone Administration View was opened, and to exit Zone Administration View.

Zone Tab

You can use the Zone tab to create and manage zones.

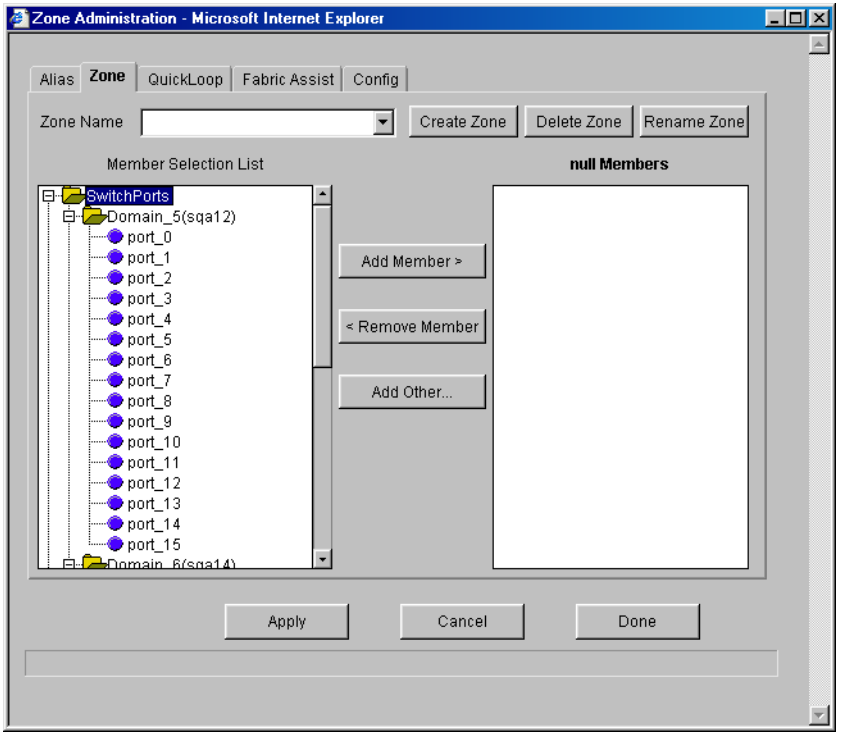


Figure 27. Zone Tab in Zone Administration View

Following is a description of the fields on the Zone tab.

Zone Name	To modify an existing zone, select a zone name.
Create Zone	Click to create a new zone. A dialog displays in which you can enter the name of the new zone. All names must be unique and contain no spaces.
Delete Zone	Click to delete the zone selected in the Zone Name field. Deleting a zone automatically removes it from all zone configurations.

Rename Zone	Click to edit the name of the zone selected in the Zone Name field. A dialog displays in which you can edit the name of the zone.
Member Selection List	A list of potential zone members, including switches, ports, WWNs, aliases, and QuickLoop AL_PAs.
Add Member	Click to add the member selected in the Member Selection List to the Zone Members list. If an entire switch is selected, all ports on the switch are added to the zone. You can also select individual ports. To add a device WWN, select either a node WWN (folder icon) or port WWN (blue circle icon) from the WWN sub-tree. To add an alias to the zone, select it from the Alias sub-tree (the alias must already exist).
Remove Member	Click to remove the selected member from the [Zone name] Members list.
Add Other	Click to add a WWN, switch, port, or QuickLoop AL_PA that is not listed in the Member Selection List.
[Zone name] Members	The members of the zone selected in the Zone Name field. The name of this list depends on the name of the selected zone. If no zone is selected, the name displays as “null Members.”
Apply	Click to apply all changes made since Zone Administration View was opened, including changes made on other tabs in the view. Changes cannot be cancelled after they are applied.
Cancel	Click to cancel all changes since the changes were last applied and to exit Zone Administration. Changes cannot be cancelled after they are applied.
Done	Click to apply all changes made since Zone Administration View was opened, and to exit Zone Administration View.

QuickLoop Tab

You can use this tab to create and manage QuickLoops in conjunction with Zoning. For information on managing the QuickLoop feature separately from zoning, see “Loop Tab” on page 145.

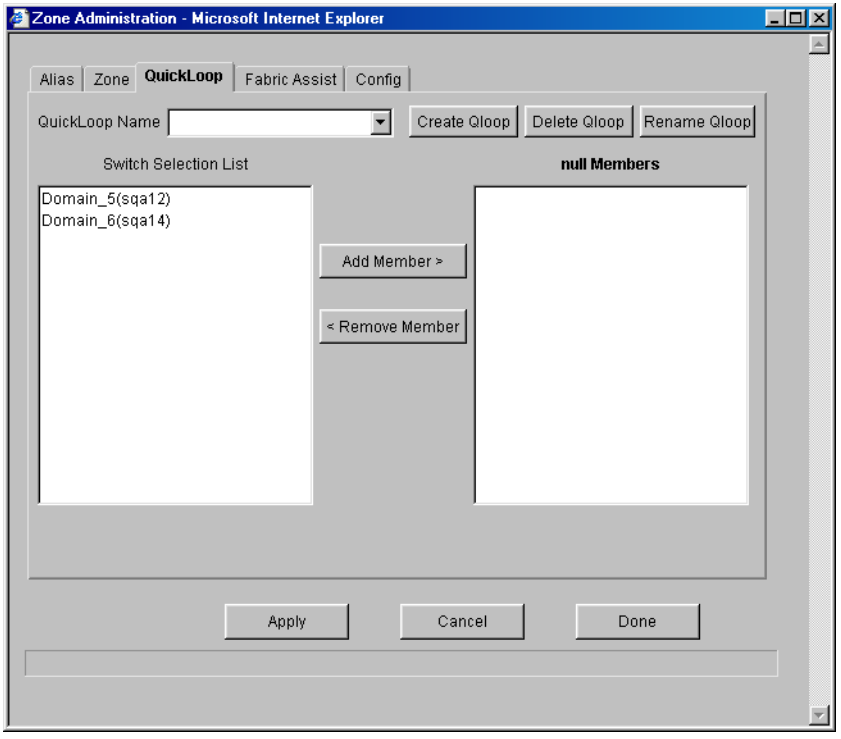


Figure 28. QuickLoop Tab in Zone Administration View

Following is a description of the fields on the QuickLoop tab.

QuickLoop Name	To modify an existing QuickLoop, select a QuickLoop name.
Create Qloop	Click to create a new QuickLoop. A dialog displays in which you can enter the name of the new QuickLoop. All names must be unique and contain no spaces.

Delete Qloop	Click to delete the QuickLoop selected in the QuickLoop Name field. Deleting a QuickLoop automatically removes it from all aliases, zones, and zone configurations, including the associated AL_PAs.
Rename Qloop	Click to edit the name of the QuickLoop selected in the QuickLoop Name field. A dialog displays in which you can edit the name of the QuickLoop.
Switch Selection List	A list of the switches available to add to the QuickLoop.
Add Member	Click to add the switch selected in the Switch Selection List to the QuickLoop Members list.
Remove Member	Click to remove the selected member from the [QuickLoop name] Members list.
[QuickLoop name] Members	A list of the members of the QuickLoop currently selected in the QuickLoop Name field. The name of this list depends on the name of the selected QuickLoop. If no QuickLoop is selected, the name displays as “null Members.”
Apply	Click to apply all changes made since Zone Administration View was opened, including changes made on other tabs in the view. Changes cannot be cancelled after they are applied.
Cancel	Click to cancel all changes since the changes were last applied, and to exit Zone Administration. Changes cannot be cancelled after they are applied.
Done	Click to apply all changes made since Zone Administration View was opened, and to exit Zone Administration View.

Config Tab

You can use the Config tab to create and manage zone configurations.

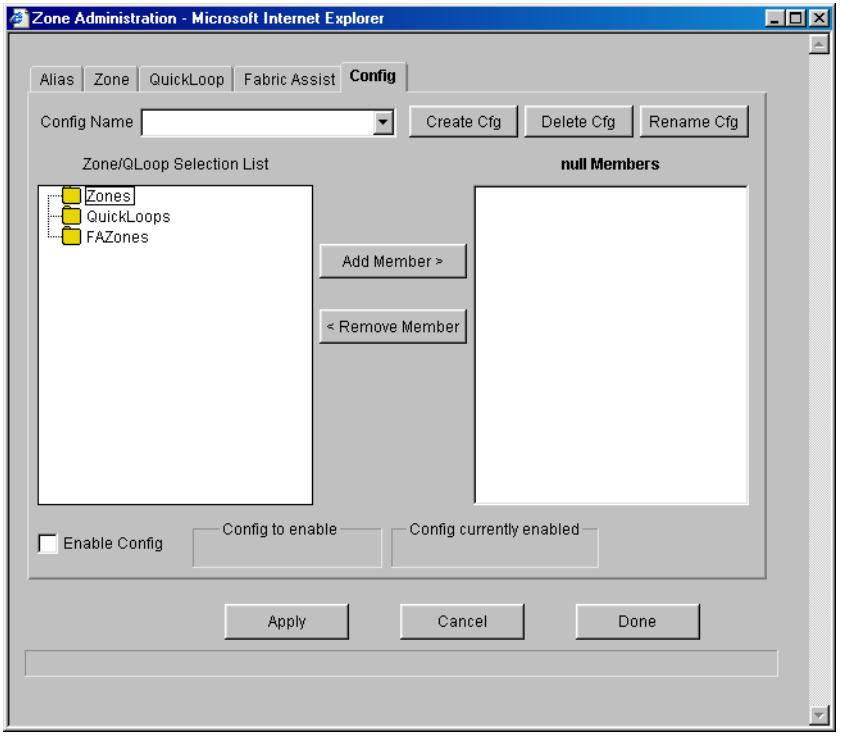


Figure 29. Config Tab in Zone Administration View

Following is a description of the fields on the Config tab.

Config Name	To modify an existing configuration, select a configuration name.
Create Cfg	Click to create a new configuration. A dialog displays in which you can enter the name of the new configuration. All names must be unique and contain no spaces.
Delete Cfg	Click to delete the configuration selected in the Config Name field.

Rename Cfg	Click to edit the name of the configuration selected in the Config Name field.
Zone/QLoop Selection List	A list of the zones and QuickLoops available to add to the configuration.
Add Member	Click to add the switch selected in the Zone/QLoop Selection List to the Configuration Members list.
Remove Member	Click to remove the selected member from the [Configuration name] Members list.
[Configuration name] Members	The members of the configuration selected in the Config Name field. The name of this list depends on the selection. Only one configuration can be enabled at a time; if none are enabled, zoning is not active in the fabric.
Enable Config	Check to enable the configuration selected in the Config Name field, or uncheck to disable it.
Config to enable	Displays the name of the configuration that is currently selected for enabling. This configuration can be enabled by clicking Apply.
Config currently enabled	Displays the name of the currently enabled configuration. Only one configuration can be enabled at a time.
Apply	Click to apply all changes made since Zone Administration View was opened, including changes made on other tabs in the view. Changes cannot be cancelled after they are applied.
Cancel	Click to cancel all changes since they were last applied, and to exit Zone Administration View. Changes cannot be cancelled after they are applied.
Done	Click to apply all changes made since Zone Administration View was opened, and to exit Zone Administration View.

Fabric Manager Log

The Fabric Manager Log includes system events and error messages.

To access the Fabric Manager Log:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

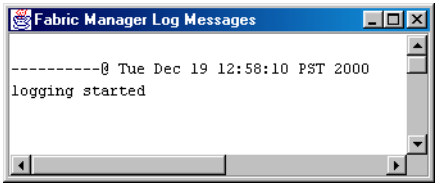
   Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

   Fabric Manager launches, displaying the default view, Fabric View.

4. From Fabric View, click Fabric Log.

   The Fabric Manager Log displays.



Switch View for the FC 6164

FC 6164 Group View represents all six switches in the FC 6164, and displays when you click an FC 6164 Integrated Fabric icon in Fabric View. The background color of each Switch icon in this view indicates the status of that switch, as close as possible to the real-time status of that switch.

To access FC 6164 Group View:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

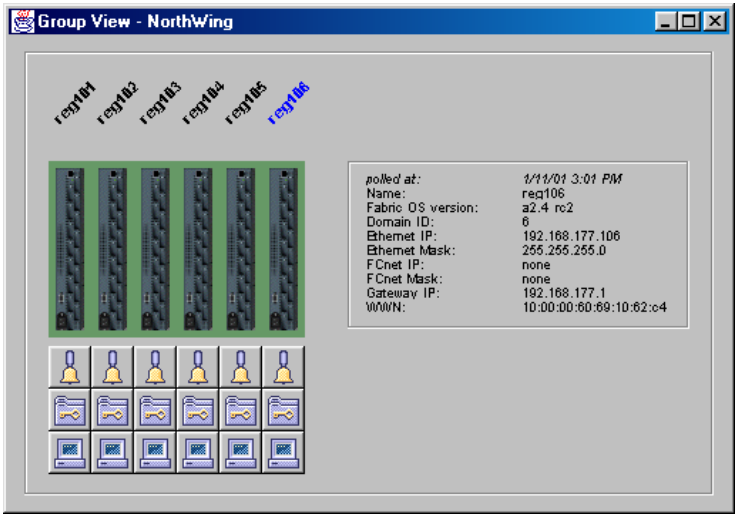
Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

   Fabric Manager launches, displaying the default view, Fabric View.

4. From Fabric View, click FC 6164 Integrated Fabric.

   FC 6164 Group View displays.



5. Click the switch for which you want to view detailed information. The information that displays to the right of the panel is updated for the selected switch.

Note Switch View for an individual switch in the FC6164 can be accessed from this panel by double-clicking the corresponding Switch icon in this graphic.

Following is a description of the items and information available in the FC 6164 Group View.

Switch Icons	Click to open Switch View for the selected switch. The background color around the icon indicates the status of the switch (for information about Switch View, see "Switch View for Individual Switches" on page 129).
Switch Names (listed above the Switch icons)	The name of each switch is listed above the corresponding switch icon.
polled at:	The date and time at which the selected switch was last polled.
Name:	The name of the selected switch.
Fabric OS version:	The Fabric OS version installed on the selected switch.
Domain ID:	The domain number of the selected switch - a number that uniquely identifies the switch in the fabric.
Ethernet IP:	The Ethernet IP address of the selected switch.
Ethernet Mask:	The Ethernet mask value of the selected switch.
F Cnet IP:	The Fibre channel IP address of the selected switch.
F Cnet Mask:	The Fibre channel net mask value of the selected switch.
Gateway IP:	The IP address of the default gateway of the selected switch. Must be properly set to access switch from other networks.
WWN:	The worldwide name (a unique numeric identifier) for the selected switch, assigned by the manufacturer.

Switch View for Individual Switches

Switch View displays when you click a Switch icon in Fabric View. This view provides information about the overall status of the switch, and the status of the individual elements in the switch. The information displayed is as close as possible to a real-time view of switch status. If the switch is not functioning properly, a message explains the problem detected.

Note Switch status is calculated approximately once per second; however the initial calculation does not occur until 30 to 60 seconds after the switch is booted.

To access Switch View for an individual switch:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

   Note This switch is assumed to be the local domain.

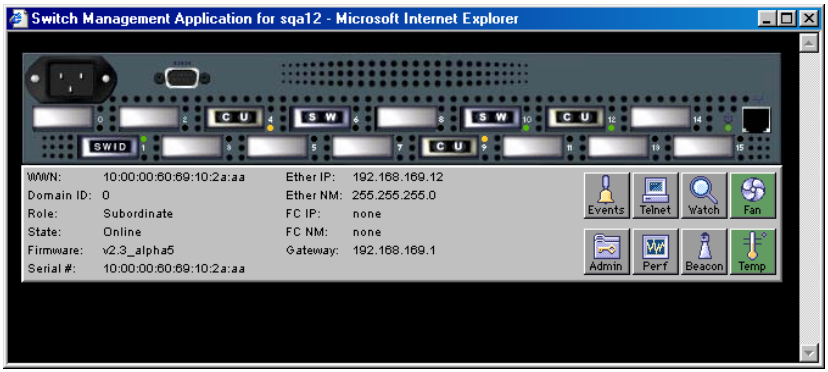
3. Press the Enter key to submit the address.

   Fabric Manager launches, displaying the default view, Fabric View.

4. In Fabric View, find the relevant Switch Panel and click Switch.

   If the switch is an FC 6164, click the FC 6164 Integrated Fabric icon to display the FC 6164 Group View, then click the relevant Switch icon in the Group View.

   Switch View displays.



Following is a description of the items and information available in Switch View.

Port icons	The letters in the Port icon indicate the GBIC (Gigabit Interface Converter) type, as follows: • blank No GBIC present • SW Short wave GBIC • LW Long wave GBIC • SWID Short wave serial ID GBIC • LWID Long wave serial ID GBIC A yellow outline around a port icon indicates port failure. For detailed port information, click the Port icon to see Port Information View.
Port numbers (on the right of each port)	The number of the port.

LED Status Indicators (round light next to each port)	The color indicates the status of the port. • No light — No device attached. • Steady yellow — Receiving light, but not online; check cable connections. • Slowly flashing yellow — Disabled (diagnostics or portDisable command). • Rapidly flashing yellow — Error, fault with port. • Steady green — Online (connected with device by cable). • Slowly flashing green — Online but segmented (loopback cable or incompatible switch). • Rapidly flashing green — Internal loopback (diagnostic) • Flickering green — Online and transmitting and receiving frames.
Power supply	Removable power assemblies are updated to show the presence, absence, and status of each: • Green — Power supply present and operational. • Red X — Power supply present but not operational. • Cover plate — Power supply absent or not fully plugged in.
Events	Click to access Switch Events View.
Telnet	Click to launch a Telnet session.

Fabric Watch (optional software)	Click to access Fabric Watch.
Fan	The background color of the button indicates the overall status of the fans: • Green Healthy • Yellow Marginal (mix of good and faulty readings) • Red Down (more than two faulty readings) • Gray Unknown or unmonitored
Admin	Click to display the Administrative interface where you can perform switch management functions.
Perf	Click to display the Performance View where you can monitor switch performance.
Beacon	Click to turn on the beaconing function. If on, this icon shows beams of light. The beaconing function helps to physically locate a switch by sending a signal to the specified switch, resulting in an LED light pattern flashing from side to side on the switch.
Temp	The background color of the button indicates the overall temperature status: • Green Healthy • Yellow Marginal (less than two faulty readings) • Red Down (more than two faulty readings) • Gray Unknown or unmonitored

WWN	Unique numeric identifier for each switch; assigned by manufacturer.
Domain ID	Number that uniquely identifies the switch in a fabric.
Role	Indicates the current role of the switch. • Principal — The principal switch as defined by FC_SW protocol. • Subordinate — Enabled but not the principal switch. • Disabled — Disabled.
State	Indicates the current state of the switch, which can be online, offline, testing, or faulty.
Firmware	Fabric OS version.
Serial #	The serial number of the switch being viewed.
Ether IP	Ethernet IP address.
Ether NM	Ethernet netmask value.
FC IP	Fibre channel IP address.
FC NM	Fibre channel netmask value.
Gateway	IP address of default gateway. Must be properly set to access switch from other networks.

Switch Events View

Switch Events View displays a log of events for the selected switch.

To access Switch Events View:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

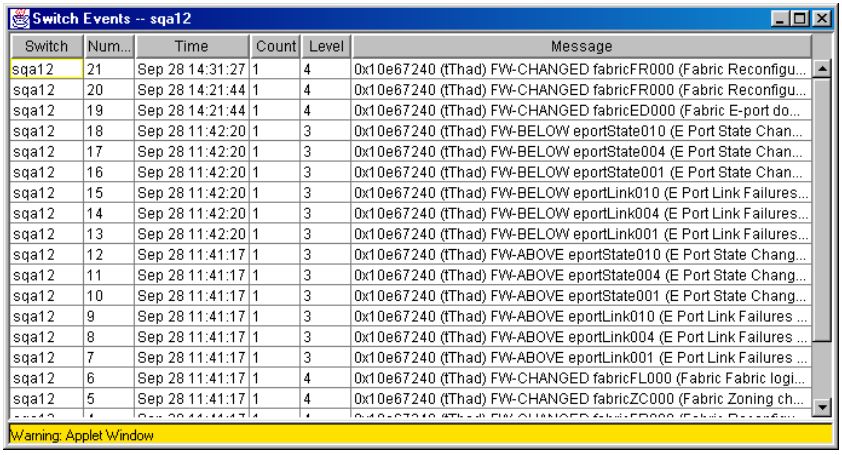
   Fabric Manager launches, displaying the default view, Fabric View.

4. From Fabric View, find the relevant Switch Panel and click Switch.

   Switch View displays.

5. From the Switch View, click Events.

   Switch Events View displays.


Switch Events -- sqa12
Switch | Num... | Time | Count | Level | Message
sqa12 | 21 | Sep 28 14:31:27 | 1 | 4 | 0x10e67240 (tThad) FW-CHANGED fabricFR000 (Fabric Reconfigu...
sqa12 | 20 | Sep 28 14:21:44 | 1 | 4 | 0x10e67240 (tThad) FW-CHANGED fabricFR000 (Fabric Reconfigu...
sqa12 | 19 | Sep 28 14:21:44 | 1 | 4 | 0x10e67240 (tThad) FW-CHANGED fabricED000 (Fabric E-port do...
sqa12 | 18 | Sep 28 11:42:20 | 1 | 3 | 0x10e67240 (tThad) FW-BELOW eportState010 (E Port State Chan...
sqa12 | 17 | Sep 28 11:42:20 | 1 | 3 | 0x10e67240 (tThad) FW-BELOW eportState004 (E Port State Chan...
sqa12 | 16 | Sep 28 11:42:20 | 1 | 3 | 0x10e67240 (tThad) FW-BELOW eportState001 (E Port State Chan...
sqa12 | 15 | Sep 28 11:42:20 | 1 | 3 | 0x10e67240 (tThad) FW-BELOW eportLink010 (E Port Link Failures...
sqa12 | 14 | Sep 28 11:42:20 | 1 | 3 | 0x10e67240 (tThad) FW-BELOW eportLink004 (E Port Link Failures...
sqa12 | 13 | Sep 28 11:42:20 | 1 | 3 | 0x10e67240 (tThad) FW-BELOW eportLink001 (E Port Link Failures...
sqa12 | 12 | Sep 28 11:41:17 | 1 | 3 | 0x10e67240 (tThad) FW-ABOVE eportState010 (E Port State Chang...
sqa12 | 11 | Sep 28 11:41:17 | 1 | 3 | 0x10e67240 (tThad) FW-ABOVE eportState004 (E Port State Chang...
sqa12 | 10 | Sep 28 11:41:17 | 1 | 3 | 0x10e67240 (tThad) FW-ABOVE eportState001 (E Port State Chang...
sqa12 | 9 | Sep 28 11:41:17 | 1 | 3 | 0x10e67240 (tThad) FW-ABOVE eportLink010 (E Port Link Failures ...
sqa12 | 8 | Sep 28 11:41:17 | 1 | 3 | 0x10e67240 (tThad) FW-ABOVE eportLink004 (E Port Link Failures ...
sqa12 | 7 | Sep 28 11:41:17 | 1 | 3 | 0x10e67240 (tThad) FW-ABOVE eportLink001 (E Port Link Failures ...
sqa12 | 6 | Sep 28 11:41:17 | 1 | 4 | 0x10e67240 (tThad) FW-CHANGED fabricFL000 (Fabric Fabric logi...
sqa12 | 5 | Sep 28 11:41:17 | 1 | 4 | 0x10e67240 (tThad) FW-CHANGED fabricZC000 (Fabric Zoning ch...
Warning: Applet Window

Note To sort the events by a particular column, click the column header. To resize a column, drag the column divider.

Following is a description of the columns in Switch Events View.

Switch	Name of switch.
Number	Event number.
Time	Time of event.
Count	Number of back-to-back occurrences of same event.

Level	Severity level of event: 0 panic (switch reboots) 1 critical 2 error 3 warning 4 information 5 debug
Message	Description of event.

Port Information View

Port Information View displays statistics for the selected port. This information is automatically updated when the view is opened, and is also refreshed periodically while the view remains open.

To access Port Information View:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

   Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

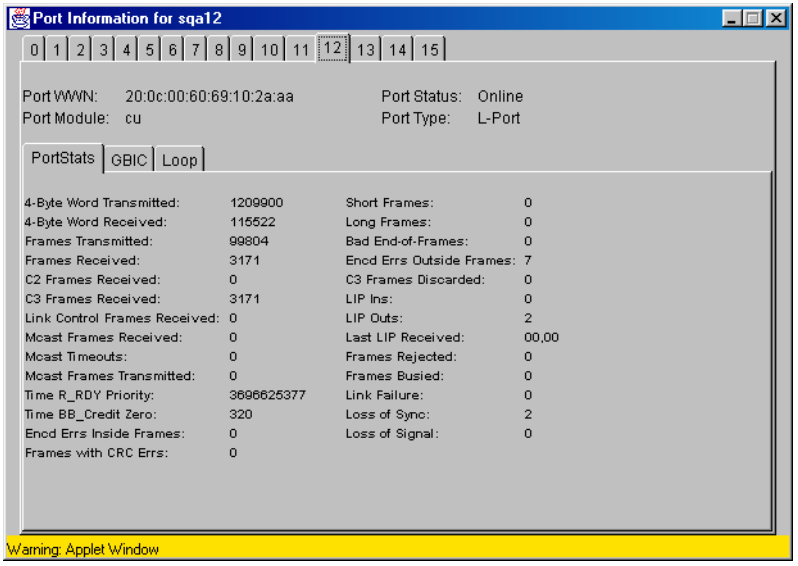
   Fabric Manager launches, displaying the default view, Fabric View.

4. In Fabric View, find the relevant Switch Panel and click Switch.

   Switch View displays.

5. From Switch View, click Port.

   Port Information View displays.


Port Information for sqa12
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Port WWN: 20:0c:00:60:69:10:2a:aa
Port Module: cu
Port Status: Online
Port Type: L-Port
PortStats GBIC Loop
4-Byte Word Transmitted: 1209900
4-Byte Word Received: 115522
Frames Transmitted: 99804
Frames Received: 3171
C2 Frames Received: 0
C3 Frames Received: 3171
Link Control Frames Received: 0
Mcast Frames Received: 0
Mcast Timeouts: 0
Mcast Frames Transmitted: 0
Time R_RDY Priority: 3696625377
Time BB_Credit Zero: 320
Encd Errs Inside Frames: 0
Frames with CRC Errs: 0
Short Frames: 0
Long Frames: 0
Bad End-of-Frames: 0
Encd Errs Outside Frames: 7
C3 Frames Discarded: 0
LIP Ins: 0
LIP Outs: 2
Last LIP Received: 00,00
Frames Rejected: 0
Frames Busied: 0
Link Failure: 0
Loss of Sync: 2
Loss of Signal: 0
Warning: Applet Window

6. Click the numbered tabs at the top of the window to specify the port for which you want to view information.

The following tabs are available in Port Information View, and are described on the listed pages:

- "PortStats Tab" on page 139
- "GBIC Tab" on page 141
- "Loop Tab" on page 145

Following is a description of the fields that are visible in Port Information View, regardless of which tab is selected.

Port World Wide Name	World Wide Name (WWN) of this port.
Port Module	The GBIC type, as follows: • -- No GBIC present • SW Short wave GBIC • LW Long wave GBIC • SWID Short wave serial ID GBIC • LWID Long wave serial ID GBIC
Port Status	The current status of the port. • No_Module No GBIC module is in this port. • No_Light Module is not receiving light. • No_Sync Module is receiving light but out of sync. • In_Sync Module is receiving light and in sync. • Laser_Flt Module signaling a laser fault (defective GBIC). • Port_Flt Port is marked faulty (defective GBIC, cable, or device). • Diag_Flt Port failed diagnostics. • Online Port is up and running. • Lock_Ref Port is locking to reference signal.

	Note Removing a cable from an E_Port temporarily generates errors, causing the status to show as faulty. The status returns to healthy when the sample interval has passed (the default interval is 1 minute).
Port Type	The type of port. • E_Port Switch link port • G_Port Generic port • U_Port Universal port • F_Port Fabric port • FL_Port Fabric loop port • L_Port Loop port

PortStats Tab

The PortStats tab provides information about transmission speed, reception speed, and the volume of traffic through the selected port.

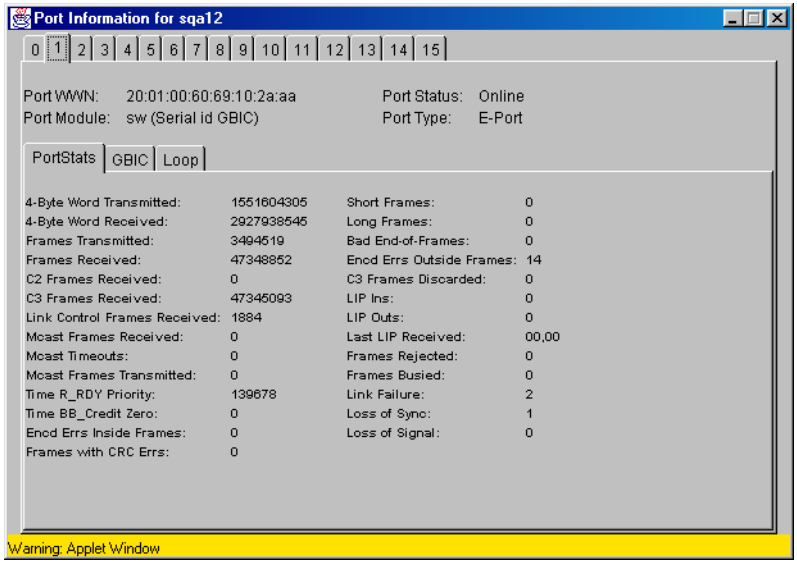

Port Information for sqa12
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Port WWN: 20:01:00:60:69:10:2a:aa
Port Module: sw (Serial id GBIC)
Port Status: Online
Port Type: E-Port
PortStats GBIC Loop
4-Byte Word Transmitted: 1551604305
4-Byte Word Received: 2927938545
Frames Transmitted: 3494519
Frames Received: 47348852
C2 Frames Received: 0
C3 Frames Received: 47345093
Link Control Frames Received: 1884
Mcast Frames Received: 0
Mcast Timeouts: 0
Mcast Frames Transmitted: 0
Time R_RDY Priority: 139678
Time BB_Credit Zero: 0
Encd Errs Inside Frames: 0
Frames with CRC Errs: 0
Short Frames: 0
Long Frames: 0
Bad End-of-Frames: 0
Encd Errs Outside Frames: 14
C3 Frames Discarded: 0
LIP Ins: 0
LIP Outs: 0
Last LIP Received: 00,00
Frames Rejected: 0
Frames Busied: 0
Link Failure: 2
Loss of Sync: 1
Loss of Signal: 0
Warning: Applet Window

Figure 30. PortStats Tab in Port Information View

Following is a description of the fields on the PortStats tab:

4-Byte Word Transmitted	Number of four-byte words transmitted.
4-Byte Word Received	Number of four-byte words received.
Frames Transmitted	Number of frames transmitted.
Frames Received	Number of frames received.
C2 Frames Received	Number of class 2 frames received.
C3 Frames Received	Number of class 3 frames received.
Link Control Frames Received	Number of link control frames received.
Mcast Frames Received	Number of multicast frames received.
Mcast Time-outs	Number of multicast timeouts.

Mcast Frames Transmitted	Number of multicast frames transmitted.
Time R_RDY Priority	Number of times R_RDY has priority over frames to be sent.
Time BB_Credit Zero	Number of times BB_Credit went to zero.
Encd Errs Inside Frames	Number of encoding errors inside frames.
Frames with CRC Errs	Number of frames with CRC errors.
Short Frames	Number of frames shorter than minimum.
Long Frames	Number of frames longer than maximum.
Bad End-of-Frames	Number of frames with faulty end-of-frames.
Encd Errs Outside Frames	Number of frames with encoding errors outside frames.
C3 Frames Discarded	Number of class 3 frames discarded.
LIP Ins	Number of LIPs received.
LIP Outs	Number of times loop initialized by FL_Port.
Last LIP Received	Last LIP received: AL_PD, AL_PS.
Frames Rejected	Number of F_RJTs sent.
Frames Busied	Number of F_BSYs sent.
Link Failure	Number of times NOS received/sent.
Loss of Sync	Number of times loss of sync occurred.
Loss of Signal	Number of times loss of signal occurred.

GBIC Tab

Note The information on this tab is only available for ports that contain GBICs.

This GBIC tab provides information about the GBIC (Gigabit Interface Converter) installed in the selected port. The information displayed depends on the type of GBIC installed:

Standard GBIC	Module type (short wave or long wave).
Serial ID GBIC	Module type, plus extended information about capabilities, interfaces, and manufacturer.
Smart Finisar GBIC	All the above information, plus GBIC active status.

If the port does not contain a GBIC, the following message displays: “Not a serial ID GBIC. No GBIC info available.”

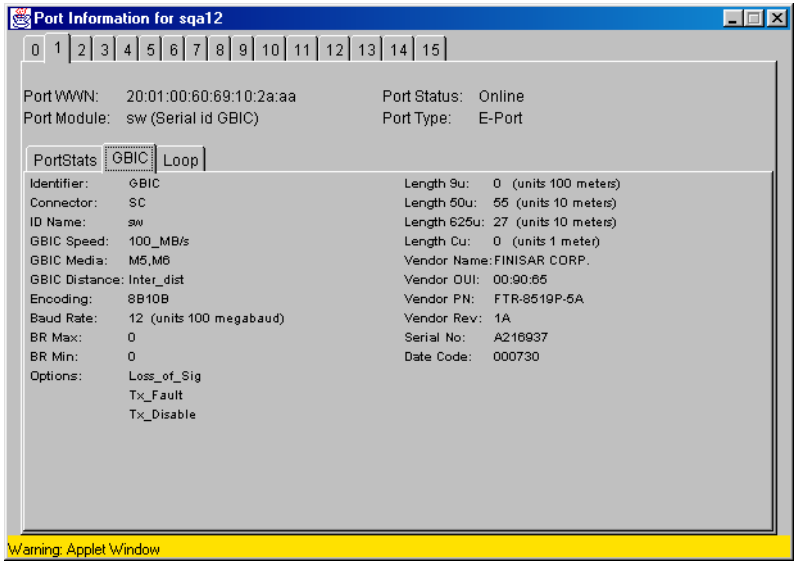


Figure 31. GBIC Tab in Port Information View

Following is a description of the fields on the GBIC tab:

Identifier	Indicates the type of serial transceiver, which can be GBIC or on-board.
Connector	Indicates the external connector type, which can be one of the following: • SC • BNC/TNC • Coaxial
ID Name	Indicates the GBIC module type: • -- No GBIC present • sw Short wave GBIC • lw Long wave GBIC • swid Short wave serial ID GBIC • lwid Short wave serial ID GBIC • cuid Short wave serial ID GBIC
GBIC Speed	Indicates the GBIC speed, which can be 100, 200, or 400 MB/sec.
GBIC Media	Indicates the transmission media, which can be: • SM Single mode • M5 Multi-mode, 50u • M6 Multi-mode, 62.5u • TV Video coax • MI Miniature coax • TP Shielded twisted pair • TW Twin axial pair

GBIC Distance	Indicates the length of the fibre channel link, which can be long distance, intermediate distance, or short distance.
Encoding	Indicates the serial encoding mechanism, which can be 8B10B, 4B5B, NRZ, or Manchester.
Baud Rate	Nominal baud rate in units of 100 Megabyte.
BR Max	Upper limit at which GBIC meets its specifications (in units of 1% above nominal baud rate).
BR Min	Lower limit at which GBIC meets its specifications (in units of 1% below nominal baud rate).
Options	Can indicate any of the following: • Loss of Signal • Loss of Signal Inverted • Transmission Fault • Transmission Disable
Length 9u	Length of link using single-mode fibre.
Length 50u	Length of link using 50um multi-mode fibre.
Length 625u	Length of link using 62.5um multi-mode fibre.
Vendor Name	Name of vendor.
Vendor OUI	Unique identifier for vendor.
Vendor P/N	Vendor part number.
Vendor Rev	Vendor revision number.
Serial No.	Vendor serial number.
Date Code	Vendor date code.

Smart GBIC Data (only displays if a smart GBIC is present):	
Temperature	Module temperature (in Centigrade).
Rx Power	Received optical power in micro Watts.
Tx Power	Transmitted optical power in micro Watts (longwave only).
Current	Laser diode drive current in mAmps.

Loop Tab

Note The information on this tab is available only for those ports that are loop-enabled.

The Loop tab provides information about any loop on the port, including the following:

- Loop statistics
- Local AL_PA statistics

If the port is not a loop-enabled port, the following information displays: “Not an L_Port. No loop info available.”

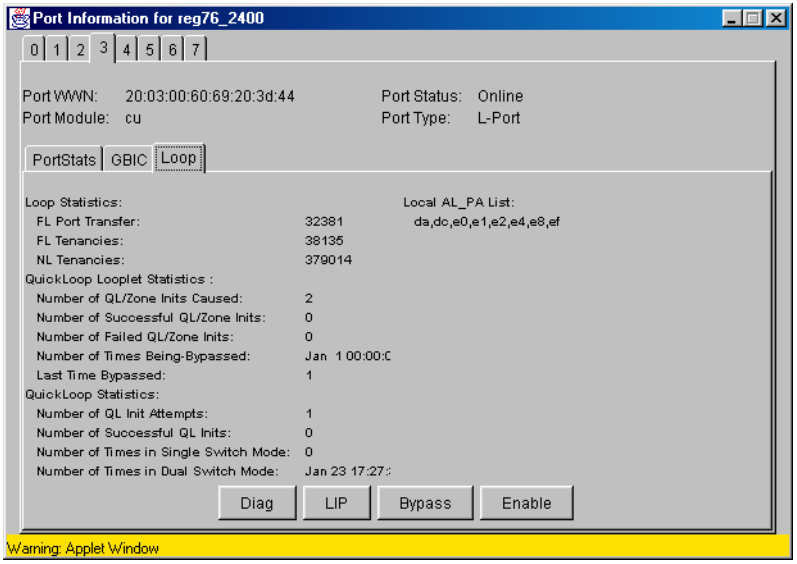

Port Information for reg76_2400
0 1 2 3 4 5 6 7
Port WWN: 20:03:00:60:69:20:3d:44
Port Status: Online
Port Module: cu
Port Type: L-Port
PortStats GBIC Loop
Loop Statistics:
Local AL_PA List:
FL Port Transfer: 32381
da,dc,e0,e1,e2,e4,e8,ef
FL Tenancies: 38135
NL Tenancies: 379014
QuickLoop Looplet Statistics :
Number of QL/Zone Inits Caused: 2
Number of Successful QL/Zone Inits: 0
Number of Failed QL/Zone Inits: 0
Number of Times Being-Bypassed: Jan 1 00:00:0
Last Time Bypassed: 1
QuickLoop Statistics:
Number of QL Init Attempts: 1
Number of Successful QL Inits: 0
Number of Times in Single Switch Mode: 0
Number of Times in Dual Switch Mode: Jan 23 17:27:
Diag
LIP
Bypass
Enable
Warning: Applet Window

Figure 32. Loop Tab in Port Information View

Following is a description of the fields on the Loop tab:

FL Port Transfer	Displays number of times FL_Port used transfer state.
FL Tenancies	Displays the number of times FL_Port opens loop tenancy.
NL Tenancies	Displays the number of times NL_Port opens loop tenancy.
Number of QL/Zone Inits Caused	Displays number of times looplet has caused QuickLoop to be initialized.
Number of Successful QL/Zones Inits	Displays number of times looplet has successfully initialized.
Number of Failed QL/Zone Inits	Displays number of times looplet failed to successfully initialize.
Number of Times Being Bypassed	Displays number of times looplet was not included as part of QuickLoop.
Last Time Bypassed	Displays time that looplet was last bypassed.
Local AL_PA List	Displays list of AL_PAs associated with devices connected to loop.
Number of QL Init Attempts	Displays number of times QuickLoop attempted initialization.
Number of Successful QL Inits	Displays number of time QuickLoop successfully initialized.
Number of Times in Single Switch Mode	Displays number of times switch reverted to single switch mode.
Number of Times in Dual Switch Mode	Displays number of times switch operated in dual switch mode.
Time of Last QL Init	Displays time of latest QuickLoop initialization.
Switch, Port Caused the Last Init	Displays the switch or port number that caused the latest initialization.

Diag	Click to open the Loop Diagnostics dialog box, which enables you to run loop diagnostics (requires password). For more information, see “Loop Diagnostics Dialog Box” on page 148.
LIP	Click to open the LIP dialog box, which enables you to initialize the loop (requires password). For more information, see “LIP Dialog Box” on page 149.
Bypass	Click to open the Bypass dialog box, which enables you to bypass a specified looplet (requires password). For more information, see “Bypass Dialog Box” on page 149.
Enable	Click to open the Enable dialog box, which enables you to enable an AL_PA on a specified looplet (requires password). For more information, see “Enable Dialog Box” on page 150.

Loop Diagnostics Dialog Box

This dialog appears when you click **Diag** on the Loop tab of Port Information View. You can use the Loop Diagnostics option to identify faulty devices on a loop.

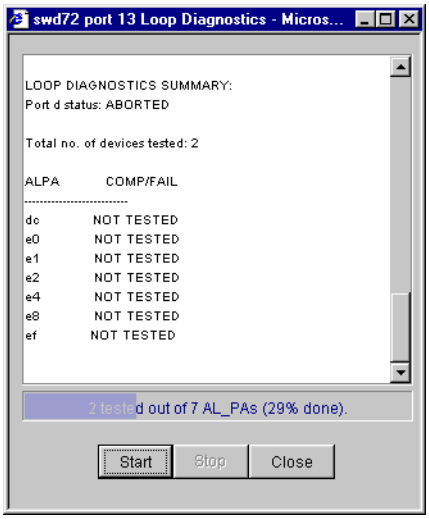


Figure 33. Loop Diagnostics Dialog Box

Following is a description of the fields in the Loop Diagnostics dialog box:

Start	Click to start the Loop Diagnostics on the specified port.
Stop	Click to stop (abort) Loop Diagnostics on the specified port.
Close	Click to close the Loop Diagnostics function.

LIP Dialog Box

You can use the LIP (Loop Initialization Process) option to initialize a loop port. To access this option, click LIP on the Loop tab of Port Information View. The LIP dialog box displays.

Figure 34. LIP Dialog Box

Following is a description of the fields in the LIP dialog box:

Apply	Click to initialize a loop port.
Close	Click to close the LIP dialog box.

Bypass Dialog Box

You can use the Bypass option to bypass an AL_PA (device) on the loop port. To access this option, click Bypass on the Loop tab of Port Information View.

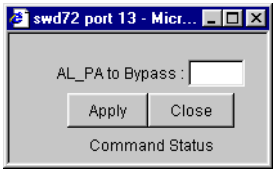


Figure 35. Bypass Dialog Box

Following is a description of the fields in the Bypass dialog box:

AL_PA to Bypass	Specify the AL_PA number to bypass. Do not bypass the last AL_PA on the loop, because this puts it into a loopback state, which requires a reboot to return it to an L-Port state.
Apply	Click to bypass an AL_PA on the loop port (must be a valid AL_PA).
Close	Click to close the Bypass dialog box.

Enable Dialog Box

You can use the Enable option to enable an AL_PA on the loop port that was previously bypassed. To access this option, click Enable on the Loop tab of Port Information View.

Figure 36. Enable Dialog Box

Following is a description of the fields in the Enable dialog box:

AL_PA to Enable	Specify AL_PA to be enabled. Entering oxff enables all AL_PAs in the loop.
Apply	Click to enable the AL_PA (must be valid AL_PA).
Close	Click to close Enable an AL_PA window.

Fabric Watch View (Optional Software)

You can use Fabric Watch View to monitor fabric elements for potential problem conditions. For detailed information about Fabric Watch, see the *Fabric Watch Users Guide*.

To access Fabric Watch View:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

   Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

   Fabric Manager launches, displaying the default view, Fabric View.

4. In Fabric View, find the relevant Switch Panel and click Switch.

   Switch View displays.

5. From Switch View, click Watch.

   Fabric Watch View displays (see Figure 37).

Fabric Watch View Tabs

Fabric Watch View contains the following tabs:

- Alarm Notifications (selected by default)
- Configure Thresholds
- Current Settings

In addition, an organizational tree appears on the left, showing all Fabric Watch areas regardless of which tab is selected. To expand or contract a folder in the tree, double-click the folder.

Alarm Notifications Tab

You can use the Alarm Notifications tab to view and customize the Fabric Watch notifications. You can either accept the default notifications, or select the Custom option and specify the type of notification (Syslog, SNMP_Trap, or Port log lock) for each type of event.

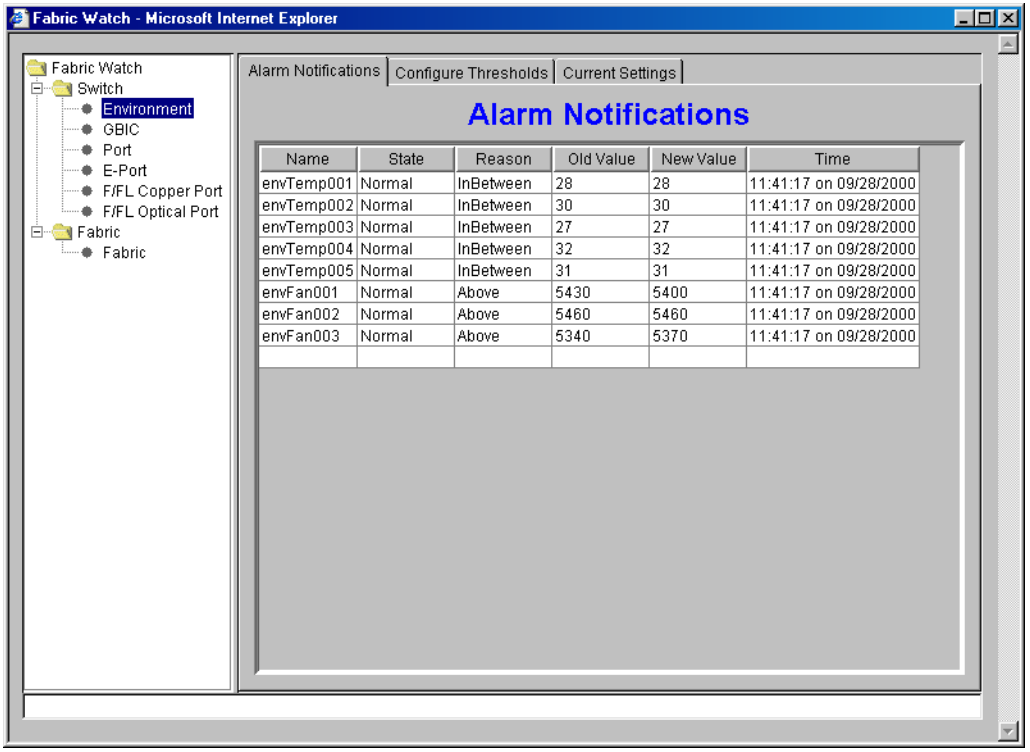

Fabric Watch - Microsoft Internet Explorer
Fabric Watch
Switch
Environment
GBIC
Port
E-Port
F/FL Copper Port
F/FL Optical Port
Fabric
Fabric
Alarm Notifications
Configure Thresholds
Current Settings
Alarm Notifications
Name State Reason Old Value New Value Time
envTemp001 Normal InBetween 28 28 11:41:17 on 09/28/2000
envTemp002 Normal InBetween 30 30 11:41:17 on 09/28/2000
envTemp003 Normal InBetween 27 27 11:41:17 on 09/28/2000
envTemp004 Normal InBetween 32 32 11:41:17 on 09/28/2000
envTemp005 Normal InBetween 31 31 11:41:17 on 09/28/2000
envFan001 Normal Above 5430 5400 11:41:17 on 09/28/2000
envFan002 Normal Above 5460 5460 11:41:17 on 09/28/2000
envFan003 Normal Above 5340 5370 11:41:17 on 09/28/2000

Figure 37. Alarm Notifications Tab in Fabric Watch View

Configure Thresholds Tab

You can use the Configure Thresholds tab to view and configure Fabric Watch thresholds, for the Fabric Watch class currently selected in the organizational tree on the left side of the window.

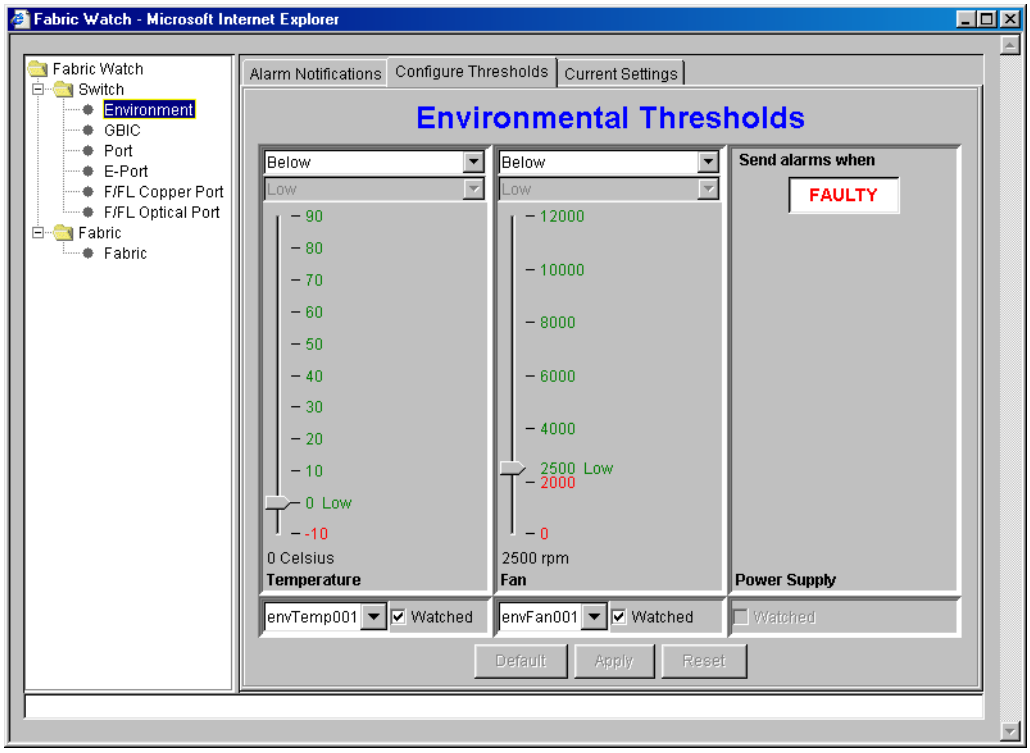


Figure 38. Configure Thresholds Tab with Environment Class Selected

The information displayed on the Configure Thresholds tab is specific to the class and area selected in the organizational tree. However, the

Configure Thresholds tab always contains Default, Apply and Reset buttons:

Default	Click to return settings to default values.
Apply	Click to apply the values specified in the current display. When Apply is clicked after a change, the Alarm Mechanism dialog displays: To continue, select the type of alarm you want and click Apply.
Reset	Click to undo the last changes that were applied.

Thresholds for the Environmental and GBIC Classes

The Environmental and GBIC classes both display a separate column for each area (see Figure 38).

The columns for the *Temperature*, *Fan*, *RX Power*, and *TX Power* areas contain the following items:	
Threshold Type drop-down list	Select the threshold type (outranged, above, in-between, below, changed).
High/Low drop-down list	Select to enter the high and low settings for the threshold type selected in the Threshold Type drop-down list (not available for all areas).
Scale	Specify the point at which you want to set the specified threshold.
Area drop-down list	Select a Fabric Watch area.

Watched checkbox	Check or uncheck to specify whether you want this area watched (not available for all areas).
The columns for the *Power Supply* and *Current* areas contain the following item:	
"Send alarms when" box	Use this text box to specify whether you want to be notified when the area is in the acceptable range (OK) or is faulty (FAULTY).

Thresholds for the Remaining Classes

The Port, E-Port, F/FL, and F/FL Optical Port classes display the following fields for each area (Link Loss, Sync Loss, Signal Loss, Protocol Error, Invalid Words, Invalid CRCs, State Changes, RX Performance, and TX Performance).

Low text box	Enter the lowest number of occurrences that are acceptable.
High text box	Enter the highest number of occurrences that are acceptable.
Threshold Type drop-down list	Select the type of threshold.
Time period drop-down list	Select the time period you want applied to frequency measurements.

Figure 39 displays thresholds for Port class.

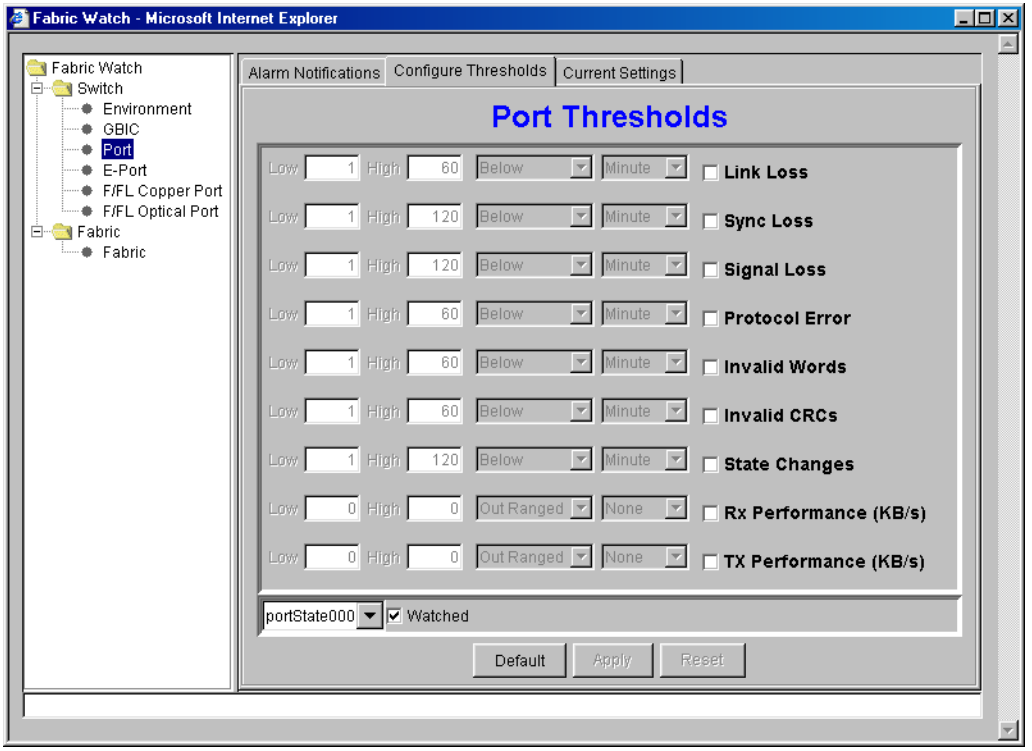


Figure 39. Configure Threshold Tab with Port Class Selected

Current Settings Tab

The Current Settings tab enables you to view the current Fabric Watch threshold parameters for the area selected in the Fabric Watch tree.

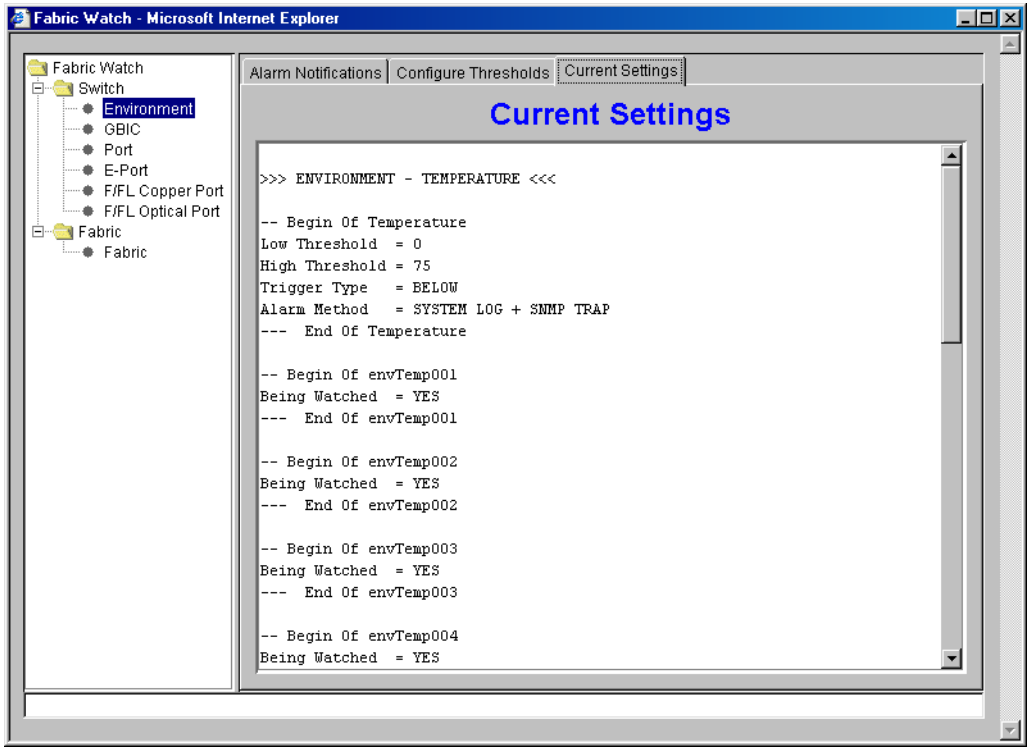


Figure 40. Current Settings Tab in Fabric Watch View

Performance View

Performance View graphically displays throughput (megabytes per second) for each port and also for the entire switch. “Port throughput” is the number of bytes received at a port plus the number of bytes transmitted. “Switch throughput” is the sum of the throughput for all the ports.

To access Performance View:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

   Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

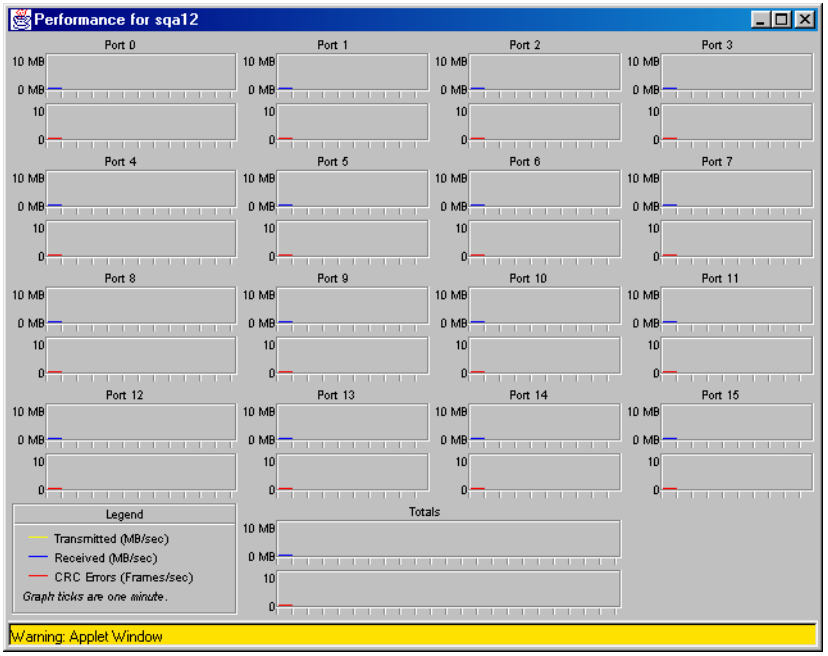
   Fabric Manager launches, displaying the default view, Fabric View.

4. In Fabric View, find the relevant Switch Panel and click Switch.

   Switch View displays.

5. From Switch View, click Performance.

   Performance View displays.



In addition to the port graphs, a graph for the entire switch is provided at the bottom of the window. Resizing the window changes the size and shape of all the individual graphs.

In both the port and switch graphs, the horizontal axis represents elapsed time and the vertical axis represents throughput. Each port graph contains up to 60 seconds of performance data, and the switch graph at the bottom of the view can contain up to 4 minutes of data.

Administrative Interface

The Administrative Interface provides access to the administrative functions though the following tabs:

- "Switch Admin Tab" on page 161
- "User Admin Tab" on page 164
- "Firmware Upgrade Tab" on page 165
- "Reboot Switch Tab" on page 167
- "SNMP Admin Tab" on page 168
- "License Admin Tab" on page 170
- "Remote Switch Tab (Optional Software)" on page 171
- "QuickLoop Admin Tab" on page 172
- "Config Admin Tab" on page 175
- "Extended Fabric Tab (Optional Software)" on page 177

Note The Administrative Interface requires administrative privileges. When an administrative login is entered, administrative privileges remain available from that workstation until the web browser is exited.

To access the Administrative Interface:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

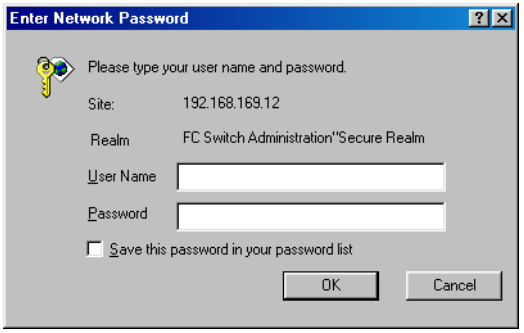
   Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

   Fabric Manager launches, displaying the default view, Fabric View.

4. In Fabric View, find the relevant Switch Panel and click Admin.

   The Enter Network Password dialog displays.



5. Enter your user name and password. The logon account must have administrative privileges.

6. Click OK.

   The Administrative Interface displays, with the Switch Admin tab selected by default.

Switch Admin Tab

You can use the Switch Admin tab to change IP information, enable or disable a switch, change the domain, change the switch name, see which ports are enabled, and enable or disable individual ports.

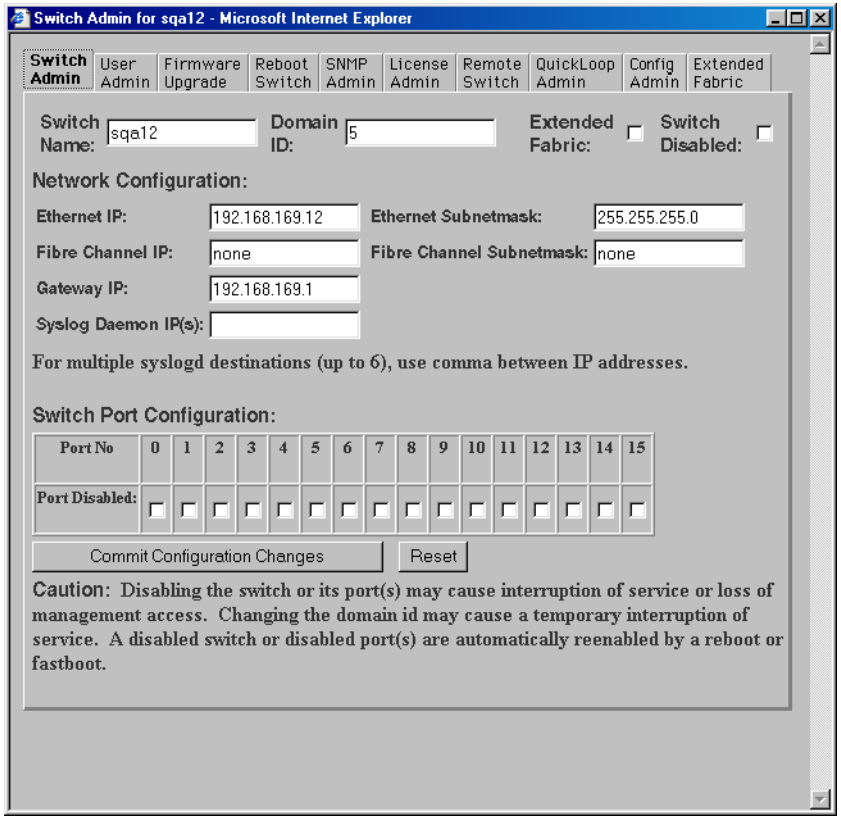


Figure 41. Switch Admin Tab

Following is a description of the fields on the Switch Admin tab.

Switch Name	Displays or sets the switch name. To change the name, enter the new name in this field.
Domain ID	Displays or sets the switch domain ID. Domain IDs must be unique within a fabric. To change the domain ID, enter the new domain ID in this field. Use a number from 1 to 239 for normal operating mode (FCSW compatible), and a number from 0 to 31 for VC encoded address format mode.
Extended Fabric	Check to configure the ports for long distance, or uncheck to turn the option off.
Switch Disabled	Check to disable the switch, or uncheck to enable the switch.
Ethernet IP	Displays or sets the IP address for the Ethernet connection to the switch.
Ethernet Subnetmask	Displays or sets the Ethernet subnetmask. Default value is none. Contact network administrator for the value to enter. If the value has changed, restart the browser.
Fibre Channel IP	Displays or sets the fibre channel IP address.
Fibre Channel Subnetmask	Displays or sets the fibre channel subnetmask. If changed, restart browser.
Gateway IP	Displays or sets the gateway IP address. Contact your network administrator for the IP address. If the address has changed, restart the browser.

Syslog Daemon IP	Displays or sets the destination station IP address to which events are sent, using syslog protocol to host. Maximum of six IP addresses (contact your network administrator for IP addresses). If messages are not to be sent, enter none or leave blank. Enter multiple addresses as a list, for example: 192.168.64.35, 192.168.62.36. On UNIX systems, a syslogd (System Log Daemon) receives the forwarded events and logs them into a well-known file. Use “man syslogd” on a Unix system for more information about events that have been forwarded by the switch to the syslogd software running on the host.
Port No	Port number.
Port Disabled	If the box is checked, the port is disabled. To enable the port, uncheck the box.
Commit Configuration Changes	Click to apply changes made.
Reset	Click to reset all fields to the values present when Switch Administration was launched.

User Admin Tab

You can use the User Admin tab to rename accounts or change passwords.

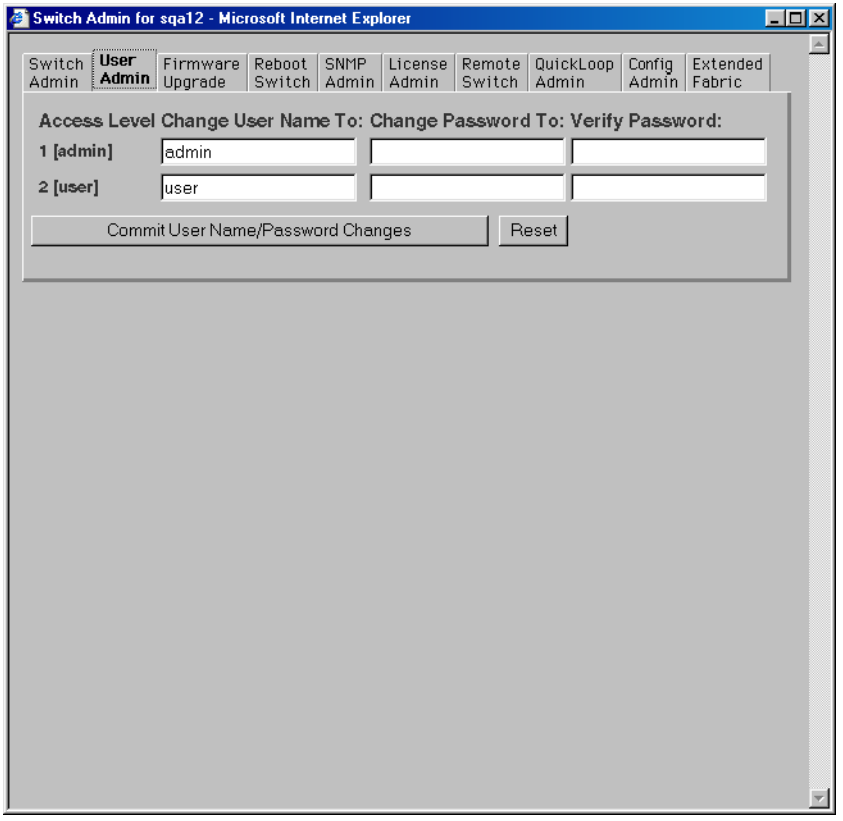


Figure 42. User Admin Tab

Following is a description of the fields on the User Admin tab.

Access Level	Access level required (admin or user).
Change User Name To	Enter new user name.
Change Password To	Enter new password.
Verify Password	Re-enter password to verify.

Commit User Name/Password Changes	Click to apply changes made.
Reset	Click to reset all fields to values set at last submission.

Firmware Upgrade Tab

You can use the Firmware Upgrade tab to download firmware upgrades.

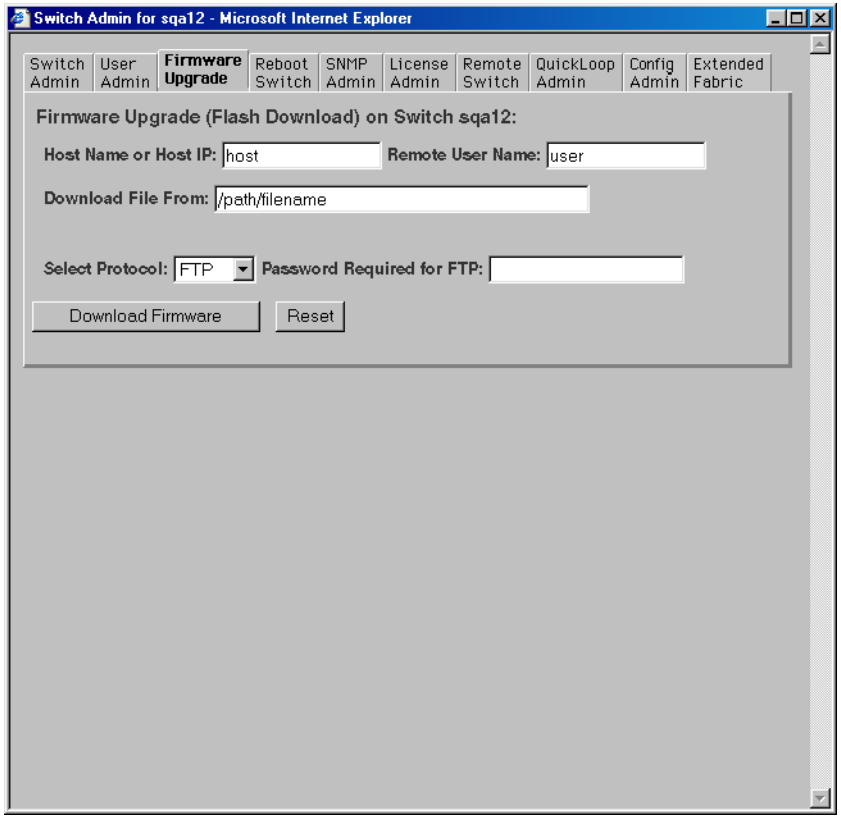


Figure 43. Firmware Upgrade Tab

Following is a description of the fields on the Firmware Upgrade tab.

Host Name or Host IP	Displays or sets host name or host IP address.
Remote User Name	Displays or sets remote user name.
Download File From	Enter fully qualified path name for firmware download.
Select Protocol	Select the protocol for the download.
Password Required for FTP	Enter a password if FTP was selected as the protocol.
Download Firmware	Click to download firmware.
Reset	Click to reset all fields to values present when Firmware Upgrade was launched.

Reboot Switch Tab

You can use the Reboot Switch tab to reboot or fastboot the switch or to disable POST (Power On Self Test) for future reboots.

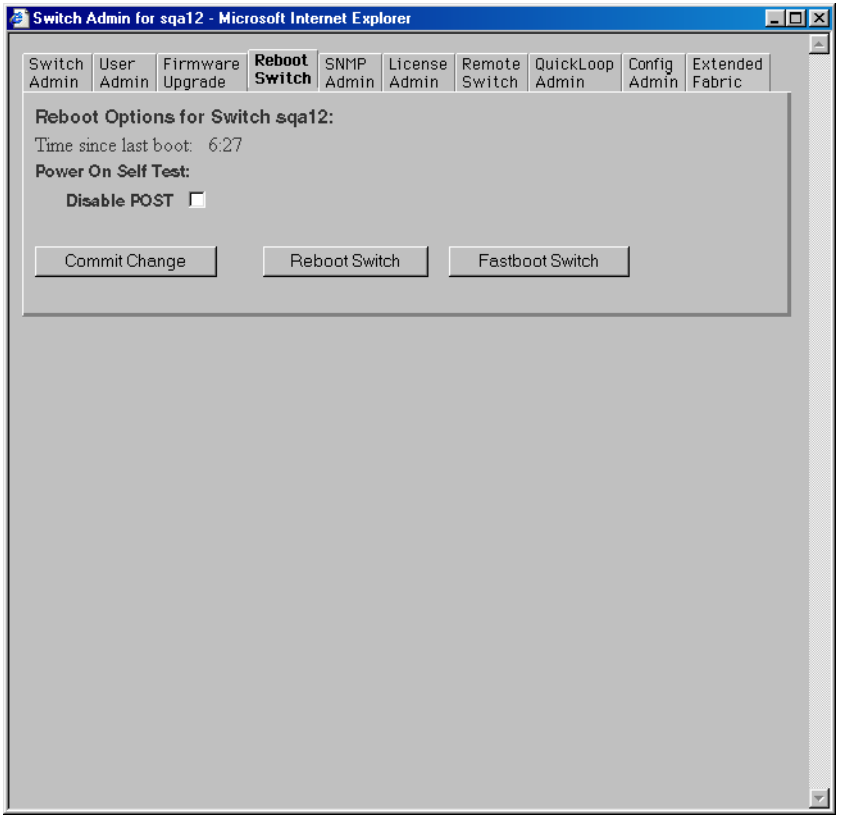


Figure 44. Reboot Switch Tab

Following is a description of the fields on the Reboot Switch tab.

Disable POST	Check to disable POST for future reboots, or uncheck to enable POST.
Commit Change	Click to save settings.
Reboot Switch	Click to reboot the switch.
Fastboot Switch	Click to perform a fast reboot. A fastboot bypasses POST. (It is the same as a reboot with POST disabled.)

SNMP Admin Tab

You can use the SNMP Admin tab to set SNMP options.

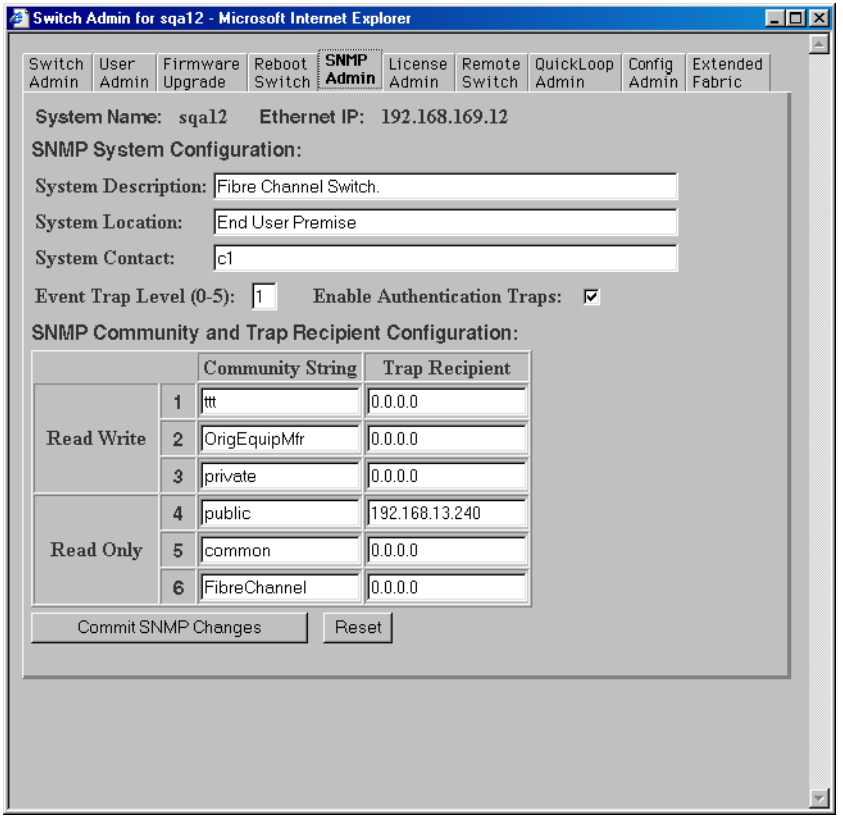


Figure 45. SNMP Admin Tab

Following is a description of the fields on the SNMP Admin tab.

System Description	Displays or sets system description. Default is Fibre Channel Switch.
System Location	Displays or sets location of switch. Default is End User Premise.
System Contact	Displays or sets contact information for switch. Default is Field Support.
Event Trap Level	Sets severity level of switch events that prompt SNMP traps. Default is 0.
Enable Authentication Traps	Click on to enable authentication traps; click off to disable (recommended).
Read Write Community String	Displays or sets up to three strings that work with the SNMP set command.
Read Only Community String	Displays or sets up to three strings that work with the SNMP get or get-next command.
Read Write and Read Only Trap Recipients	Displays or sets recipients for traps (usually IP address of SNMP management station).
Commit SNMP Changes	Click to apply changes made.
Reset	Click to reset all fields to values present when SNMP Administration was launched.

Note To disable the community string or trap recipient fields, leave them empty.

License Admin Tab

You can use the License Admin tab to view a list of installed license keys and features, or to add or remove licenses.

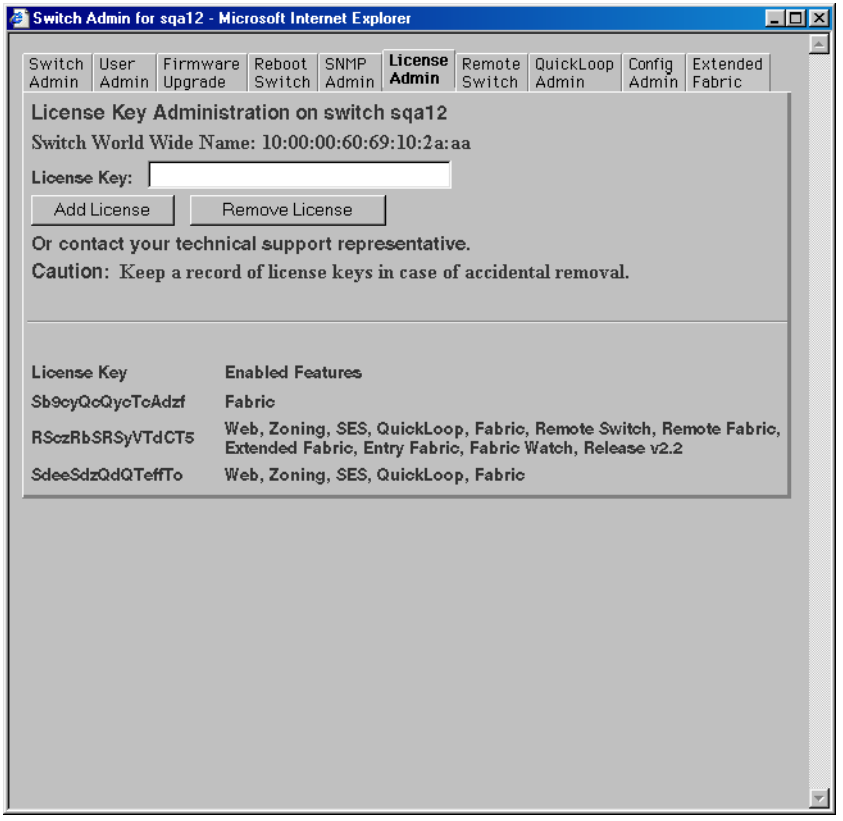


Figure 46. License Admin Tab

Following is a description of the fields on the License Admin tab.

License Key	Enter license key to be added or removed.
Add License	Click to add specified license.
Remove License	Click to remove specified license.
Text Box	A list of the licenses installed on the switch.

Remote Switch Tab (Optional Software)

Note The REMOTE SWITCH feature can only be implemented in a fabric that contains exactly two switches.

You can use the Remote Switch feature to configure a pair of switches to operate over an extended WAN interface. This enables the switches to communicate across an ATM network by using a compatible Fibre Channel to an ATM gateway. For detailed information on the Remote Switch feature, see the *Distributed Fabrics User's Guide*.

You can use the Remote Switch tab to enable or disable the Remote Switch feature on the selected switch.

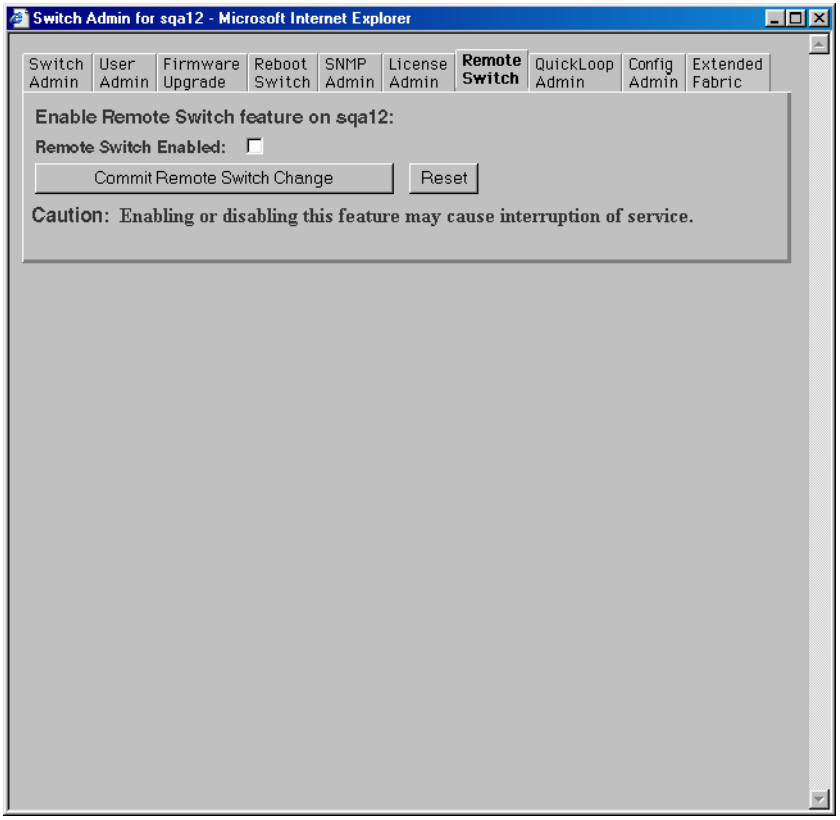


Figure 47. Remote Switch Tab

Following is a description of the fields on the Remote Switch tab.

Remote Switch Enabled	Check to enable the Remote Switch feature, or uncheck to disable it.
Commit Remote Switch Change	Click to apply changes made.
Reset	Click to reset all fields to values present when Remote Switch was launched.

QuickLoop Admin Tab

Note For information specific to QuickLoop to be available, the QuickLoop switch must be the local domain.

You can use the QuickLoop Admin tab to manage QuickLoop functionality, such as modifying a QuickLoop or setting up a partner switch. For detailed information about QuickLoop, see the *QuickLoop User's Guide*. For information about managing the additional functionality available when

QuickLoop and Zoning are used in conjunction, see "Zone Administration View" on page 117.

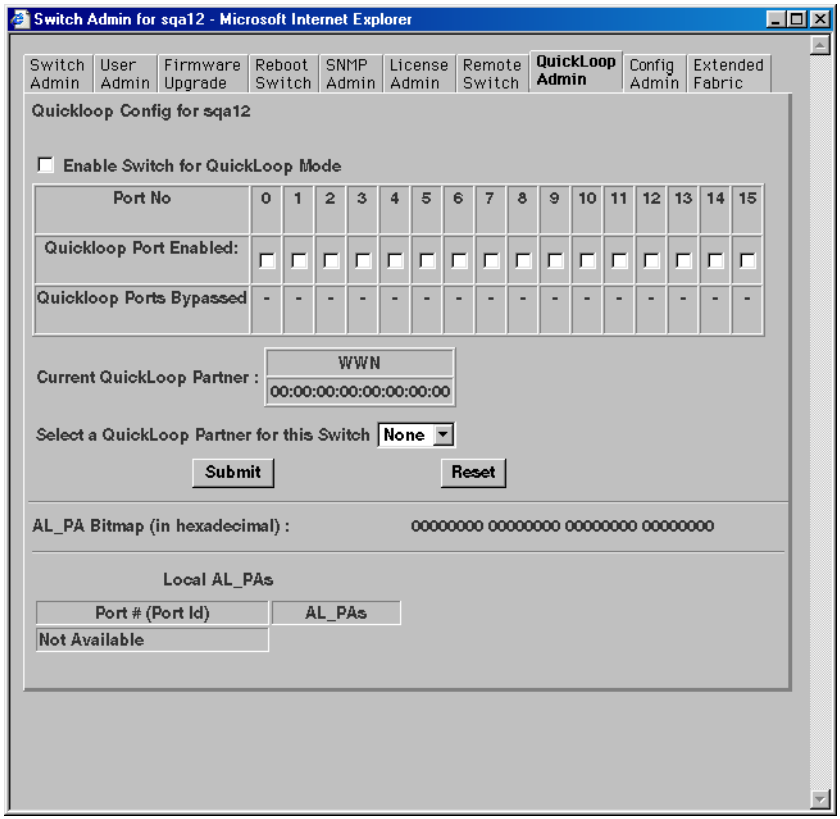


Figure 48. QuickLoop Admin Tab

Following is a description of the fields on the QuickLoop Admin tab.

Enable Switch for QuickLoop Mode	Check to enable the switch for QuickLoop, or uncheck to disable the switch for QuickLoop.
Port No	Port number.
QuickLoop Port Enabled	Check to enable the port for QuickLoop, or uncheck to disable the port for QuickLoop.

QuickLoop Ports Bypassed	If checked, indicates a port is currently bypassed.
Current QuickLoop Partner	Displays the current partner switch WWN, domain ID, and switch name of a dual-switch QuickLoop.
Select a QuickLoop Partner for this Switch	Select a switch from the list of switch names currently in the fabric as the partner switch of a dual-switch QuickLoop.
Submit	Click to apply changes made.
Reset	Click to reset all fields to values present when QuickLoop Administration was launched.
AL_PA Bitmap (in hexadecimal)	Displays the AL_PA bitmap at the end of a QuickLoop initialization.
Local AL_PAs	Lists the AL_PAs of devices connected to the local switch.
Remote AL_PAs	Lists the AL_PAs of devices connected to the remote switch in a dual-switch QuickLoop. This information only displays if a partner is configured.

Config Admin Tab

You can use the Config Admin tab to upload the switch configuration file for archiving, or to download a new configuration file from the host.

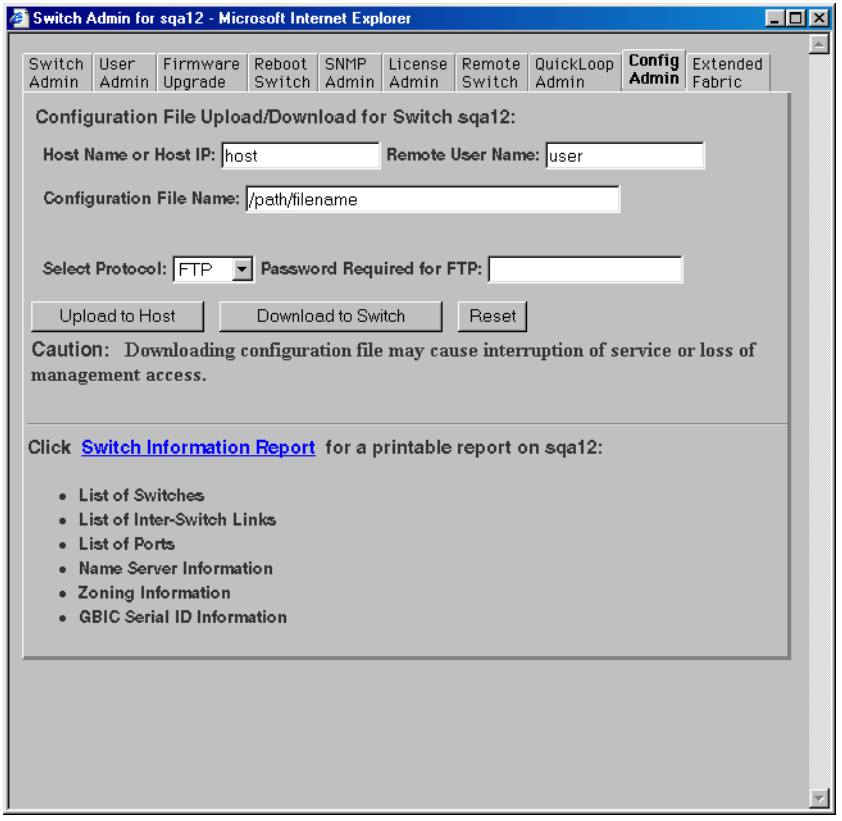


Figure 49. Config Admin Tab

Following is a description of the fields on the Config Admin tab.

Host Name or Host IP	Specify the host name or host IP address.
Remote User Name	Specify the remote user name.

Configuration File Name	Specify the name of the configuration file to be uploaded or downloaded.
Select Protocol	Specify FTP or RSHD protocols.
Password Required for FTP	Specify a password if one is required by the host.
Upload to Host	Click to retrieve configuration file from the switch.
Download to Switch	Click to send configuration file to the switch.
Reset	Click to reset all fields to values present when Configuration Administration was launched.
Switch Information Report	Click to open a browser window displaying a status report for the switch. Information can be printed or saved to file.

Switch Information Report

The Switch Information Report can be generated by clicking on the corresponding link on the Conf Admin tab in the Switch Admin window.

The report provides information about all switches, interswitch links, and ports in the fabric.

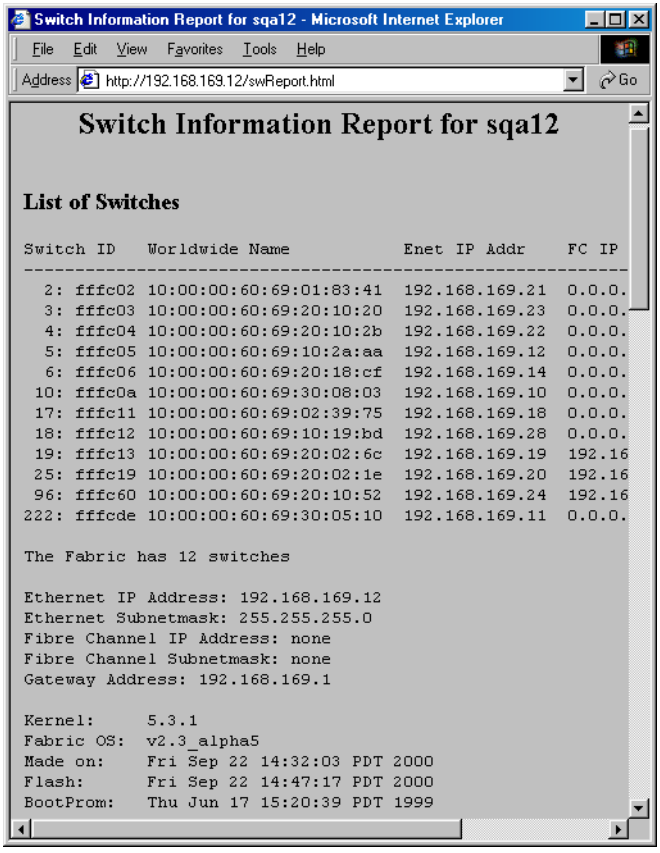


Figure 50. Switch Information Report

Extended Fabric Tab (Optional Software)

The Extended Fabric feature enables you to configure ports for a long-distance link of up to 100 KM. For detailed information on this feature, see the *Distributed Fabrics User's Guide*.

You can use the Extended Fabric tab to specify which ports you want to be configured for distance and at what level.

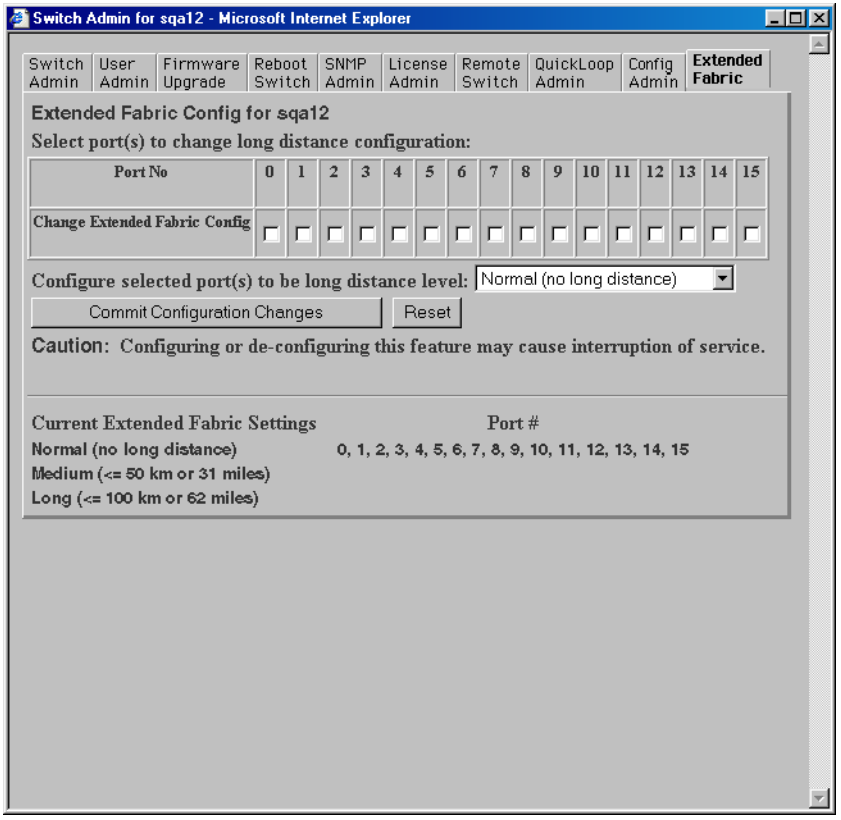

Switch Admin for sqa12 - Microsoft Internet Explorer
Switch Admin
User Admin
Firmware Upgrade
Reboot Switch
SNMP Admin
License Admin
Remote Switch
QuickLoop Admin
Config Admin
Extended Fabric
Extended Fabric Config for sqa12
Select port(s) to change long distance configuration:
Port No
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Change Extended Fabric Config
Configure selected port(s) to be long distance level:
Normal (no long distance)
Commit Configuration Changes
Reset
Caution: Configuring or de-configuring this feature may cause interruption of service.
Current Extended Fabric Settings
Port #
Normal (no long distance)
0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Medium (<= 50 km or 31 miles)
Long (<= 100 km or 62 miles)

Figure 51. Extended Fabric Tab

Following is a description of the fields on the Extended Fabric tab.

Port No	Port number.
Change Extended Fabric Configuration	Check to designate the ports for which you want to change the long-distance configuration.

Configure selected port(s) to be long distance level	Select the long-distance level to be supported for the selected ports. There are three levels available: • No long distance • 50 KM • 100 KM
Commit Configuration Changes	Click to apply configuration for Extended Fabric.
Reset	Click to reset all fields to values present when Extended Fabric was launched.
Current Extended Fabric Settings	Displays current settings by port number.

Telnet Interface

Each switch can only have one active Telnet session at a time.

Note The Telnet interface requires administrative privileges. When an administrative login is entered, administrative privileges remain available from that workstation until the session is closed and the web browser is exited.

To access the Telnet interface through Fabric Manager:

1. Select Start >Programs > Fabric Manager > Fabric Manager.

   The URL window displays.

2. Enter the switch name or IP address in the blank field.

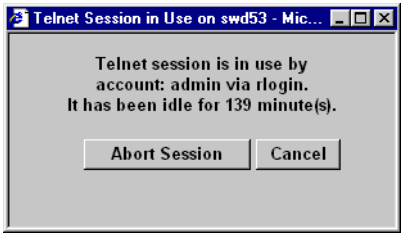
   Note This switch is assumed to be the local domain.

3. Press the Enter key to submit the address.

   Fabric Manager launches, displaying the default view, Fabric View.

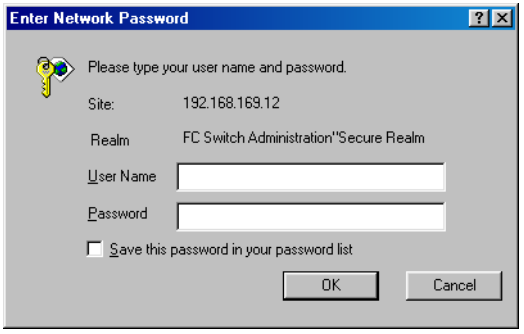
4. In Fabric View, find the relevant Switch Panel and click Telnet on the switch panel.

   If a Telnet session is already active, the following message displays.


Telnet Session in Use on swd53 - Mic...
Telnet session is in use by
account: admin via rlogin.
It has been idle for 139 minute(s).
Abort Session
Cancel

   If this message displays and you want to abort the active session, click Abort Session. Otherwise, click Cancel.

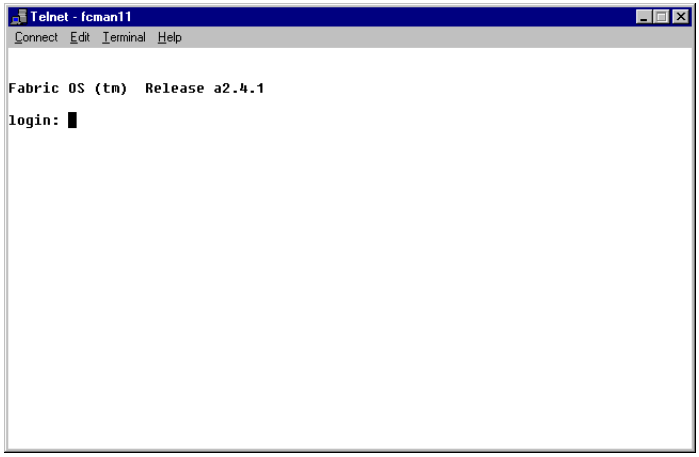
   If there is no active session or an active session has been aborted, the following dialog appears.



5. Enter your user name and password (the account used must have administrative privileges).
6. Specify whether you want the password saved (not recommended).

7. Click OK.

   The Telnet interface displays.



9

TELNET COMMANDS

The following commands were added to provide support switch group definitions:

- "islTopoCheck" on page 184
- "islTopoShow" on page 186
- "sgroupDelete" on page 189
- "sgroupRename" on page 191
- "sgroupSet" on page 193
- "sgroupShow" on page 196
- "sgroupSupportShow" on page 198
- "sgroupSwReplace" on page 202
- "switchStatusPolicySet" on page 204
- "switchStatusPolicyShow" on page 207
- "snmpMibCapSet" on page 209

Note This chapter is an addendum to the *Fabric OS Reference Manual,* which lists all commands available in the Fabric OS.

islTopoCheck

Displays ISL sgroup connections for a switch.

Synopsis islTopoCheck

Availability Administration

Description This command displays the ISL sgroup connections and status for this switch. This command is used to verify that the switch is properly cabled and configured. Each port that is specified in the ISL definition corresponding to an ISL sgroup that this switch is a member of will be displayed. A switch with properly configured ISL connections will report a status of “OK” for each of these ports.

Operands None

Example The following example shows the results of islTopoCheck on a mis-configured switch. In a proper configuration, all switches have valid domains and names, and each ports status is OK

```
es_6:admin> islTopoCheck
ISL data for type: S32_6_1, sgroup: My_group
idx     domain   expected wwn                name

01      01       10:00:00:60:69:20:02:9f     jr_1003
02      02       10:00:00:60:69:10:a0:4e     es_6
03      -01      00:00:00:00:00:00:00:03     -UNKNOWN-
04      -01      00:00:00:00:00:00:00:04     -UNKNOWN-
05      -01      00:00:00:00:00:00:00:05     -UNKNOWN-
06      -01      00:00:00:00:00:00:00:06     -UNKNOWN-
```

Domain: 2, wwn: 10:00:00:60:69:10:a0:4e

isl port	expected switch	port	actual switch	port	status
0 08 ->	jr_1003	: 00	jr_1003	: 00	OK
1 09 ->	jr_1003	: 01	jr_1003	: 01	OK
2 10 ->	jr_1003	: 02	jr_1003	: 03	Wrong port
3 11 ->	jr_1003	: 03	-UNKNOWN-	:-01	Bad status
4 12 ->	-UNKNOWN-	: 12	-UNKNOWN-	:-01	Bad status
5 13 ->	-UNKNOWN-	: 13	jr_1003	: 07	Wrong switch
6 14 ->	-UNKNOWN-	: 14	-UNKNOWN-	:-01	Bad status
7 15 ->	-UNKNOWN-	: 15	-UNKNOWN-	:-01	Bad status

See Also islTopoShow

islTopoShow

Displays ISL switch group topology and status.

Synopsis islTopoShow [sgroup]

Availability All users

Description This command displays the current connections and status for all switches in the ISL switch groups of which the current switch is a member. The status for every port and switch combination in each active ISL group is displayed.

Operands This command has the following operand:

sgroup	Specify a switch group or switch group type to display the ISL connection status for that specific switch group or switch group type. If no operand is entered, the default behavior is to display the topology status for all ISL sgroups of which the current switch is a member.

Example The following example shows the results of islTopoShow on a mis-configured switch. In a proper configuration, all switches have valid domains and names, and each ports status is OK.

```
es_6:admin> islTopoShow

ISL data for type: S32_6_1, sgroup: My_group

idx     domain  expected                wwn name
01      01      10:00:00:60:69:20:02:9f jr_1003
02      02      10:00:00:60:69:10:a0:4e es_6
03      -01     00:00:00:00:00:00:00:03 -UNKNOWN-
04      -01     00:00:00:00:00:00:00:04 -UNKNOWN-
05      -01     00:00:00:00:00:00:00:05 -UNKNOWN-
06      -01     00:00:00:00:00:00:00:06 -UNKNOWN-

Switch idx: 1 Domain: 1, wwn: 10:00:00:60:69:20:02:9f

isl port  expected switch    port   actual switch      port status
0  00 -> es_6               : 08   es_6               : 08   OK
1  01 -> es_6               : 09   es_6               : 09   OK
2  02 -> es_6               : 10   -UNKNOWN-         :-01   No record
3  03 -> es_6               : 11   es_6               : 10   Wrong port
4  04 -> -UNKNOWN-          : 08   -UNKNOWN-         :-01   No record
5  05 -> -UNKNOWN-          : 09   -UNKNOWN-         :-01   No record
6  06 -> -UNKNOWN-          : 10   -UNKNOWN-         :-01   No record
7  07 -> -UNKNOWN-          : 11   es_6               : 13   Wrong switch
8  08 -> -UNKNOWN-          : 08   -UNKNOWN-         :-01   No record
```

```
9  09 -> -UNKNOWN-       : 09   -UNKNOWN-    :-01   No record
10  10 -> -UNKNOWN-      : 10   -UNKNOWN-     :-01   No record
11  11 -> -UNKNOWN-      : 11   -UNKNOWN-     :-01   No record
12  12 -> -UNKNOWN-      : 08   -UNKNOWN-     :-01   No record
13  13 -> -UNKNOWN-      : 09   -UNKNOWN-     :-01   No record
14  14 -> -UNKNOWN-      : 10   -UNKNOWN-     :-01   No record
15  15 -> -UNKNOWN-      : 11   -UNKNOWN-     :-01   No record

Switch idx: 2 Domain: 2, wwn: 10:00:00:60:69:10:a0:4e

isl   port   expected switch port   actual switch   port   status
0     08 -   jr_1003          : 00   jr_1003         : 00   OK
1     09 ->  jr_1003          : 01   jr_1003         : 01   OK
2     10 ->  jr_1003          : 02   jr_1003         : 03   Wrong port
3     11 ->  jr_1003          : 03   -UNKNOWN-       :-01   No record
4     12 -   -UNKNOWN-       : 12   -UNKNOWN-       :-01   No record
5     13 -    -UNKNOWN-      : 13   jr_1003         : 07   Wrong switch
6     14 ->  -UNKNOWN-       : 14   -UNKNOWN-       :-01   No record
7     15 -    -UNKNOWN-      : 15   -UNKNOWN-       :-01   No record
```

See Also islTopoCheck

sgroupDelete

Deletes a switch group.

Synopsis sgroupDelete sgName [, force]

Availability Administration

Description This command deletes a switch group. If the parameter is not specified, the command becomes an interactive session and the necessary parameters are prompted. This command makes the same change to all switches in the specified group, and executes on every switch in the group only if each switch in the group can perform the action.

Operands This command has the following operands:

sgName	Specify a character string in quotation marks containing the switch group name to be deleted (for example “MyGroup”). Entering a wrong name causes this command to terminate without modifying any switch groups. The sgroup name is case sensitive.
force	Specify the force parameter to delete the group even if one or more members of the group failed to execute the command. The entered string must be “force”.

Example To interactively delete switch group called “MyGroup”:

```
sw:admin> sgroupDelete
Please Enter Group Name: [ ] MyGroup
About to DELETE the group with Group name “MyGroup”
ARE YOU SURE (yes, y, no, n): [no] y
Committing configuration...done.
```

This example shows what happens when an invalid group is entered:

```
sw:admin> sgroupDelete “MyPrevGroup”
Group Name “MyPrevGroup” does not exist.
```

See Also sgroupRename

sgroupSet

sgroupShow

sgroupSupportShow

sgroupSwReplace

sgroupRename

Renames a switch group.

Synopsis sgroupRename [“old_sgName”, “new_sgName”]

Availability Admininistration

Description This command renames a specified sgroup name to the given new name. The member list for the renamed group is not modified. If any parameter is not specified, the session becomes an interactive session for which all parameters are prompted.

Operands This command has the following operands:

old_Name	Specify a character string in quotation marks containing the sgroup name to be replaced, for example “MyPrevGroupName”.
new_Name	Specify a character string in quotation marks containing the new sgroup name, for example “MyNewGroupName”.

Example The following example shows the noninteractive form of sgroupRename:

```
sw:admin> sgroupShow
Group Type      Group Name                  Member WWN
========== ======================================
S32_6_1         MyPrevGroupName         10:00:00:60:69:00:00:20
                                        10:00:00:60:69:20:15:81
                                        10:00:00:60:69:10:02:18
                                        10:00:00:60:69:20:15:71
                                        10:00:00:60:69:00:30:05
                                        10:00:00:60:69:00:60:11
sw:admin> sgroupRename “MyPrevGroupName”,
“MyNewGroupName”
Committing configuration...done.
sw:admin> sgroupShow
Group Type      Group Name                  Member WWN
========== ======================================
S32_6_1         MyNewGroupName          10:00:00:60:69:00:00:20
                                        10:00:00:60:69:20:15:81
                                        10:00:00:60:69:10:02:18
                                        10:00:00:60:69:20:15:71
                                        10:00:00:60:69:00:30:05
                                        10:00:00:60:69:00:60:11
```

See Also

sgroupDelete
sgroupSet
sgroupShow
sgroupSupportShow
sgroupSwReplace

sgroupSet

Creates a switch group.

Synopsis sgroupSet [“sgType”, “sgName”, “sgMemberList”]

Availability Administration

Description This command creates a switch group. If any parameter is not specified, the session becomes an interactive session for which all parameters are prompted.

Operands This command has the following operands:

sgType	Specify a character string in quotation marks containing the sgroup type, for example “S32_6_1”. The given type must be a valid type. If the type is not valid, this command is rejected. Valid types are displayed when this command is run interactively.
sgName	Specify a character string in quotation marks containing the sgroup name, for example “FirstGroup”. The given name must have from 1 to 32 characters, and be comprised of letters, digits, or underscores. Spaces are not allowed.
sgMemberList	If given in Domain ID format, the list is validated to ensure that all specified switch Domains are valid. If given in WWN format, a Warning message can appear if any WWN given is not in the current fabric. Specify a character string in quotation marks containing the sgroup members, for example “1,2,3,4,5,6”. This list can be either the WWN format or Domain ID format. WWN format: “aa:bb:cc:dd:ee:ff:xx:yy,aa:bb:cc:dd:ee:ff:xx:zz, aa:bb:cc:dd:ee:ff:xx:ww,...,aa:bb:cc:dd:ee:ff:xx:qq” Domain ID format: “domain_ID1,domain_ID2,...,domain_IDx”

Example To set a group called “My Group” of type “S32_6_1” using Domain IDs 1 through 6:

```
sw:admin> sgroupSet “S32_6_1”, “MyGroup”, “1,2,3,4,5,6”
    Committing configuration...done.
```

The following example shows the interactive form of sgroupSet:

```
sw:admin> sgroupSet

  Here are the valid sgroup types:

      S32_6_1

Please Enter Group Type: [S32_6_1] S32_6_1

Please Enter Group Name: [ ] MyGroup

Enter member list by domain#?  (yes, y, no, n): [yes] n

For Group Member #1

enter its WWN  (in hex): [00:00:00:00:00:00:00:00] 10:00:00:60:69:00:00:20

For Group Member #2

enter its WWN  (in hex): [00:00:00:00:00:00:00:00] 10:00:00:60:69:20:15:81

For Group Member #3

enter its WWN  (in hex): [00:00:00:00:00:00:00:00] 10:00:00:60:69:10:02:18

For Group Member #4

enter its WWN  (in hex): [00:00:00:00:00:00:00:00] 10:00:00:60:69:20:15:71

For Group Member #5

enter its WWN  (in hex): [00:00:00:00:00:00:00:00] 10:00:00:60:69:00:30:05
```

For Group Member #6

enter its WWN (in hex): [00:00:00:00:00:00:00:00] 10:00:00:60:69:00:60:11

Committing configuration...done.

See Also sgroupDelete
sgroupRename
sgroupShow
sgroupSupportShow
sgroupSwReplace

sgroupShow

Displays switch group configuration information.

Synopsis sgroupShow [“sgType” | “sgName”]

Availability All users

Description This command displays switch group information. If no parameter is specified, ALL sgroup definitions will be displayed. If a parameter is specified, ALL sgroups with *sgType* or *sgName* that contain the given parameter string will be displayed.

Operands This command has the following operands:

sgType	Specify a character string in quotation marks containing the sgroup type to be displayed, for example “S32_6_1”. This operand must be enclosed in quotation marks.
SgName	Specify a character string in quotation marks containing the sgroup name to be displayed, for example “Group”. If no parameter is specified, ALL defined sgroups will be displayed. This operand must be enclosed in quotation marks.

Example To display all switch group configurations:

```
sw:admin> sgroupShow
Group Type      Group Name                  Member WWN
========== ======================================
S32_6_1         MyNewGroupName      10:00:00:60:69:00:00:20
                                    10:00:00:60:69:10:62:ee
                                    10:00:00:60:69:10:61:0e
                                    10:00:00:60:69:10:60:f9
                                    10:00:00:60:69:10:62:44
                                    10:00:00:60:69:10:60:a0
```

To display all switch groups that contain the key word “Group”:

```
sw:admin> sgroupShow “Group”
Group Type      Group Name                  Member WWN
========== ======================================
S32_6_1         MyNewGroupName      10:00:00:60:69:00:00:20
                                    10:00:00:60:69:20:15:81
                                    10:00:00:60:69:10:02:18
                                    10:00:00:60:69:20:15:71
                                    10:00:00:60:69:00:30:05
                                    10:00:00:60:69:00:60:11
```

Note **Note:** Because MyNewGroupName contains the key word “Group”, it is displayed.

See Also
sgroupDelete
sgroupRename
sgroupSet
sgroupSupportShow
sgroupSwReplace

sgroupSupportShow

Displays switch information for all switches within the specified group.

Synopsis sgroupSupportShow “sgroupName” [, “commandName”]

Availability All users

Description This command can display a range of debugging information for all switches in a switch group. If no commandName is specified or all is specified in place of a command name, all supported commands are displayed for the switches within a switch group. If a single command is specified, only the information for that command is displayed.

Operands This command has the following operands:

sgroupName	Specify the name of the switch group. This operand must be enclosed in quotation marks. This operand is required.
commandName	Specify the name of the command to be displayed for the specified switch group. If no command is specified, or all is specified, all supported commands are executed against all switches within a switch group. The following commands are supported in the order that they are executed. These commands are not case sensitive. This operand must be enclosed in quotation marks, and is optional.

- version
- uptime
- tempShow
- psShow
- licenseShow
- diagShow
- errDump
- switchShow
- portFlagsShow
- portErrShow
- mqShow
- portSemShow
- portShow
- portRegShow
- portRouteShow
- fabricShow
- topologyShow
- qlShow
- nsShow
- nsAllShow
- cfgShow
- configShow
- faultShow
- traceShow
- portLogDump

Example The following example shows how to display the temperature in all switch components of an FC 6164:

```
sw5:admin>sgroupsupportshow “starbase”, “tempshow”
Group Type      Group Name                Member WWN
================ ================================
S32_6_1         starbase                  10:00:00:60:69:10:57:91
                                          10:00:00:60:69:10:56:79
                                          10:00:00:60:69:10:58:89
                                          10:00:00:60:69:10:57:dd
                                          10:00:00:60:69:10:58:63
                                          10:00:00:60:69:10:58:3f
Please wait for remote data!
value = 0
star7:root>
=======================================
Information from Local Domain 7
=======================================
 27   30   31   33   32  Centigrade
 80   86   87   91   89  Fahrenheit
=======================================
Information from Domain 8
=======================================
 28   29   32   33   33  Centigrade
 82   84   89   91   91  Fahrenheit
=======================================
Information from Domain 9
=======================================
```

```
 27   29   33   34   32  Centigrade
 80   84   91   93   89  Fahrenheit
=======================================

Information from Domain 10

=======================================

 26   30   31   34   31  Centigrade
 78   86   87   93   87  Fahrenheit
=======================================

Information from Domain 11

=======================================

 28   29   31   33   32  Centigrade
 82   84   87   91   89  Fahrenheit
=======================================

Information from Domain 12

=======================================

 28   31   34   35   33  Centigrade
 82   87   93   95   91  Fahrenheit
==================DONE=================
```

See Also

sgroupDelete
sgroupRename
sgroupSet
sgroupShow
sgroupSwReplace

sgroupSwReplace

Replaces a member of a switch group.

Synopsis sgroupSwReplace [“sgName”, “oldWwn”, “newWwn”]

Availability Administration

Description This command replaces the member with oldWwn in group sgName with the member with newWwn. The order of members within the member list is not changed by this operation.

If any parameter is not specified, the session becomes an interactive session and all parameters are prompted.

This command makes the same change to all switches in the specified group, and executes on every switch in the group if each switch in the group can perform the action.

Operands This command has the following operands:

sgName	Specify the switch group name (for example, “NewGroup”) that contains the member you want to replace. The switch group name must be enclosed in quotation marks. This operand is optional.
oldWwn	Specify the WWN of a switch group member (for example, “10:00:00:60:69:20:22:22”) that you want to replace. The WWN must be enclosed in quotation marks. This operand is optional.
newWwn	Specify the WWN of the new member (for example, “10:00:00:60:69:20:55:55”). The WWN must be enclosed in quotation marks. This operand is optional.

Example The following example shows the noninteractive form of sgroupSwReplace. The sgroupShow command is used to illustrate the changes made with the sgroupSwReplace command.

```
sw:admin> sgroupShow
Group Type      Group Name                Member WWN
================ ================================
S32_6_1         NewGroup                  10:00:00:60:69:20:15:71
                                          10:00:00:60:69:20:15:93
                                          10:00:00:60:69:20:15:2a
                                          10:00:00:60:69:20:18:32
                                          10:00:00:60:69:20:22:22
                                          10:00:00:60:69:20:64:31
value = 0
sw:admin> sgroupSwReplace “NewGroup”,
“10:00:00:60:69:20:22:22”,
“10:00:00:60:69:20:55:55”
Committing configuration...done.
sw:admin> sgroupShow
Group Type      Group Name                Member WWN
================ ================================
S32_6_1         NewGroup                  10:00:00:60:69:20:15:71
                                          10:00:00:60:69:20:15:93
                                          10:00:00:60:69:20:15:2a
                                          10:00:00:60:69:20:18:32
                                          10:00:00:60:69:20:55:55
                                          10:00:00:60:69:20:64:31
```

See Also sgroupDelete
sgroupRename
sgroupSet
sgroupShow
sgroupSupportShow

switchStatusPolicySet

Sets the policy parameters that determine the overall switch status.

Synopsis switchStatusPolicySet

Availability Administration

Description Use this command to set the policy parameters for calculating the overall status of the switch enclosure. The policy parameter values determine how many failed or faulty units of each contributor are allowed before triggering a status change in the switch from HEALTHY to MARGINAL or DOWN.

This command prints the current parameters in a three-column table format. The first column specifies the contributor; the second column specifies the minimum number that contributes to the DOWN/FAILED status; the third column specifies the minimum number that contributes to the MARGINAL/WARNING status. This command then prompts you to change the values for each policy parameter. The default values for the policy parameters are as follows:

Contributor	Default Value for DOWN	Default Value for MARGINAL
FaultyPorts	2	1
MissingGBICs	0	0
PowerSupplies	2	1
Temperatures	2	1
Fans	2	1
PortStatus	0	0
sgroup ISLStatus	2	1

Any single contributor can force the overall status of the switch to MARGINAL or DOWN.

This command enables you to set a threshold for each contributor, so that a certain number of failures are allowed before changing the status of the switch.

If the value of a policy parameter is set to 0, it means that this factor is not used to determine the status of the switch. If the range of values for a particular contributor is set to 0 for both MARGINAL and DOWN, that contributor is not used in the calculation of the overall switch status.

ISLStatus monitors ISLs that are part of a defined switch group. The status of other ISLs on the same switch but outside of the group definition are not considered when calculating switch status. If no switch groups are defined on this switch, these ISLStatus settings have no effect on switch status.

The sgroup ISLStatus does not affect the status of the switch as quickly as the other contributors. It can take a few minutes for a switch group ISL status change to affect the state of the switch.

Note When PortStatus monitoring is set to values of (0,0), port status changes are not logged to the event log and console. Similarly, GBIC removal does not generate a message to the event log and console if MissingGBICs is set to (0,0). By configuring these options, you can more closely monitor for port status and removal of GBICs.

Operands

None

Example

Notice that in the following example, the only parameters modified are the number of FaultyPorts allowed before the status of the switch changes to MARGINAL and DOWN.

```
switch:admin> switchStatusPolicySet
   To change the overall switch status policy parameters
   The current overall switch status policy parameters:
                    Down      Marginal
  ------------------------------------------
  FaultyPorts       1         0
  MissingGBICs      0         1
  PowerSupplies     2         1
```

```
Temperatures        2        1
Fans                2        1
PortStatus          0        0
sgroup ISLStatus    2        1

    Note that the value, 0, for a parameter, means that it is

    NOT used in the calculation.

    ** In addition, if the range of settable values in the prompt is (0..0),

    ** the policy parameter is NOT applicable to the switch.

    ** Simply hit the Return key.

    The minimum number of

      FaultyPorts contributing to DOWN status: (0..8) [2]
      FaultyPorts contributing to MARGINAL status: (0..8) [1]
      MissingGBICs contributing to DOWN status: (0..8) [0]
      MissingGBICs contributing to MARGINAL status: (0..8) [0] 1
      Bad PowerSupplies contributing to DOWN status: (0..2) [2]
      Bad PowerSupplies contributing to MARGINAL status: (0..2) [1]
      Bad Temperatures contributing to DOWN status: (0..5) [2]
      Bad Temperatures contributing to MARGINAL status: (0..5) [1]
      Bad Fans contributing to DOWN status: (0..6) [2]
      Bad Fans contributing to MARGINAL status: (0..6) [1]
      Down PortStatus contributing to DOWN status: (0..8) [0]
      Down PortStatus contributing to MARGINAL status: (0..8) [0]
      Down ISLStatus contributing to DOWN status: (0..16) [2]
      Down ISLStatus contributing to MARGINAL status: (0..16) [1]

  Policy parameter set has been changed
  ... Committing configuration...done.
```

See Also switchStatusPolicyShow
switchStatusShow

switchStatusPolicyShow

Displays the policy parameters that determine the overall switch status.

Synopsis switchStatusPolicyShow

Availability All users

Description Use this command to view the current policy parameters set for the switch. These policy parameters determine the number of failed or nonoperational units allowed for each contributor before triggering a status change in the switch.

The command prints the current parameters in a three-column table format. The first column specifies the contributor; the second column specifies the minimum number that contributes to the DOWN/FAILED status; the third column specifies the minimum number that contributes to the MARGINAL/WARNING status. The default values for the policy parameters are as follows:

Contributor	Default Value for DOWN	Default Value for MARGINAL
FaultyPorts	2	1
MissingGBICs	0	0
PowerSupplies	2	1
Temperatures	2	1
Fans	2	1
PortStatus	0	0
sgroup ISLStatus	2	1

The policy parameters determine the number of failed or nonoperational units for each contributor that trigger a status change in the switch. For example, if the FaultyPorts DOWN parameter is set to 3, and 3 ports fail in the switch, the status of the switch changes to DOWN.

Operands None

Example

```
switch:admin> switchStatusPolicyShow
The current overall switch status policy parameters:
                        Down        Marginal
-----------------------------------------------------
FaultyPorts             1           0
MissingGBICs            0           1
PowerSupplies           2           1
Temperatures            3           1
Fans                    3           1
PortStatus              0           0
sgroup ISLStatus        2           1
```

See Also switchStatusShow

snmpMibCapSet

Views and modifies options for configuring SNMP MIB and Trap capability.

Synopsis snmpMibCapSet

Availability Administration

Description This command enables you to turn on or off certain MIBS and TRAPS and enables you to turn on or off group information and SSN in SW trap messages. This command first displays current settings and then prompts you to change the values for each parameter.

- FA-MIB - Specifying yes means you can access FA-MIB variables with an SNMP manager. The default value is yes.
- SW-TRAP - Specifying yes means the SNMP management application can receive SW traps from the switch. The default value is yes.
- FA-TRAP - Specifying yes means the SNMP management application can receive FA traps from the switch. The default value is yes.
- SW-EXTTRAP - Specifying yes means you can receive group information such as Group Name, Group Type, and Member Position, and SSN in the SW traps. The default value is no.

Operands None

Example

```
swd55:admin> snmpMibCapSet
The SNMP Mib/Trap Capability has been set to support
FE-MIB SW-MIB FA-MIB SW-TRAP FA-TRAP
FA-MIB (yes, y, no, n): [yes]
SW-TRAP (yes, y, no, n): [yes]
FA-TRAP (yes, y, no, n): [yes]
SW-EXTTRAP (yes, y, no, n): [no]
no change
```

See Also agtcfgShow
agtcfgSet
agtcfgDefault

A

FC 6164 WORKSHEET

The FC 6164 worksheet on the next page is provided as a data collection point for the FC 6164.This worksheet is provided for use when recording data for the FC 6164. The worksheet is referenced in Chapter 3, “Installing and Configuring the FC 6164”, and Chapter 4, “Maintenance Procedures”.

It is recommended that you photocopy the worksheet, enter the appropriate information, and retain it with the FC 6164 or the computer workstation from which the FC 6164 is accessed.

Table 14. FC 6164 Worksheet

	Switch 1 (far left)	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6
Domain ID (default)	(231)	(232)	(233)	(234)	(235)	(236)
Switch Name (default)	(sw1)	(sw2)	(sw3)	(sw4)	(sw5)	(sw6)
Worldwide Name						
Ethernet IP Address (default)	(10.77.77.77)	(10.77.77.77)	(10.77.77.77)	(10.77.77.77)	(10.77.77.77)	(10.77.77.77)
Ethernet Subnet Mask (default)	(0.0.0.0)	(0.0.0.0)	(0.0.0.0)	(0.0.0.0)	(0.0.0.0)	(0.0.0.0)
FC IP Address						
FC Subnet Mask						
Gateway Address (default)	(172.17.1.1)	(172.17.1.1)	(172.17.1.1)	(172.17.1.1)	(172.17.1.1)	(172.17.1.1)

PRODUCT REGULATORY INFORMATION

FCC EMC Statement (USA)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense. The end user of this product should be aware that any changes or modifications made to this equipment without the approval of Hewlett-Packard could result in the product not meeting the Class A limits, in which case the FCC could void the user's authority to operate the equipment.

EMC Statement (Canada)

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

EMC Statement (European Union)

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Spécification ATI Classe A (France)

DECLARATION D'INSTALLATION ET DE MISE EN EXPLOITATION d'un matériel de traitement de l'information (ATI), classé A en fonction des niveaux de perturbations radioélectriques émis, définis dans la norme européenne EN 55022 concernant la Compatibilité Electromagnétique.

Germany Noise Declaration

Schalldruckpegel Lp = 55 dB(A)
Am Arbeitsplatz (operator position)
Normaler Betrieb (normal operation)
Nach ISO 7779:1999 (Typprüfung)

VCCI EMC Statement (Japan)

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Harmonics Conformance (Japan)

高調波ガイドライン適合品

BSMI EMC Statement (Taiwan)

警告使用者：這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

RRL EMC Statement (Korea)

사용자 안내문 : A 급기기

이기기는 업무용으로 전자파 적합등록을 받은 기기이오니, 판매자 또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에서 비업무용으로 교환하시기 바랍니다.

Laser Safety

A. Certification and Classification Information

This product contains a laser internal to the GigaBit Interface Converter (GBIC) transceiver module for connection to the Fibre communications port.

In the USA, the GBIC module is certified as a Class 1 laser product conforming to the requirements contained in the Department Of Health and Human Services (DHHS) regulation 21 CFR, Subchapter J. The certification is indicated by a label on the metal GBIC housing.

Outside the USA, the GBIC is certified as a Class 1 laser product conforming to the requirements contained in IEC 825-1:1993 and EN 60825-1:1994, including Amendment 11:1996.

The GBIC includes the following certifications:

- UL Recognized Component (USA)
- CSA Certified Component (Canada)
- TUV Certified Component (European Union)
- CB Certificate (Worldwide)

The following figure shows the Class 1 information label that appears on the metal housing of the GBIC.

CLASS 1 LASER PRODUCT DHHS 21 CFR(J)

B. Product Information

Each communications port consists of a transmitter and receiver optical subassembly. The transmitter subassembly contains internally a semiconductor laser diode in the wavelength range of 780 nanometers (shortwave laser) or 1310 nanometers (longwave laser). In the event of a break anywhere in the fibre path, the GBIC control system prevents laser emissions from exceeding Class 1 levels.

Class 1 laser products are not considered hazardous.

WARNING There are no user maintenance operations, or adjustments to be performed on any GBIC module.

C. Usage Restrictions

Failure to comply with these usage restrictions may result in incorrect operation of the system and points of access may emit laser radiation above the Class 1 limits established by the IEC and U.S. DHHS.

Declaration of Conformity

DECLARATION OF CONFORMITY
according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Company
Network Storage Solutions Organization

Manufacturer's Address: 8000 Foothills Blvd.
Roseville, CA 95747
USA

declares, that the product

Product Name: HP SureStore FC Switch 6164

Model Number(s): A7326A, A7326AZ

Product Options: All

conforms to the following Product Specifications:

Safety: IEC 60950:1991 + A1, A2, A3, A4 / EN 60950:1992 + A1, A2, A3, A4, A11
GB 4943-1995
IEC 60825-1:1993 / EN 60825-1:1994 + A11, Class 1 (Laser/LED)

EMC: CISPR 22:1997 +A1 / EN 55022:1998 +A1 Class A[1]
GB 9254-1988
CISPR 24:1997 / EN 55024:1998
IEC 61000-3-2:1995 / EN 61000-3-2:1995 +A14
IEC 61000-3-3:1994 / EN 61000-3-3:1995

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly.

1) The Product was tested in a worst-case test configuration which maximizes RFI emissions.

Roseville, July 16, 2001

Frank L. Sindelar, HPSO Quality Mgr.

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)

GLOSSARY

8b/10b encoding Encoding scheme that converts each 8-bit data byte into a 10-bit transmission character. Used to balance ones and zeros in high speed transports.

Address identifier Value used to identify source or destination of a frame.

AL_PA Arbitrated Loop Physical Address. Unique 8-bit value assigned during loop initialization to each port in an arbitrated loop.

Alias Address Identifier An address identifier recognized by a port in addition to its standard identifier. An alias address identifier may be shared by multiple ports.

Alias AL_PA An AL_PA value recognized by an L_Port in addition to the AL_PA assigned to the port. See also *AL_PA*.

Alias server Fabric software facility that supports multicast group management.

ANSI American National Standards Institute. Governing body for fibre channel standards in the U.S.A.

API Application Programming Interface. Defined protocol that allows applications to interface with a set of services.

Arbitrated loop A shared 100 MBps fibre channel transport structured as a loop. Allows communication between ports without using a switch. Requires successful arbitration by a port before a circuit is established. Supports up to 126 devices and one fabric attachment. Similar to a “shared bandwidth ring” on a network.

Arbitrating State The state in which a port has become the loop master. This state is only available from the Open state.

ASIC Application-Specific Integrated Circuit.

ATM	Asynchronous Transfer Mode. Transport for transmitting data over LANs or WANs that transmit fixed-length units of data. Provides any-to-any connectivity and allows nodes to transmit simultaneously.
AW_TOV	Arbitration Wait Timeout Value. The minimum time an arbitrating L_Port waits for a response before beginning loop initialization.
Bandwidth	The total transmission capacity of a link, cable, or system.
BB_Credit	Buffer-to-buffer credit. The number of frames that can be transmitted to a directly connected recipient or within an arbitrated loop. Determined by number of available receive buffers. See also Buffer-to-buffer flow control, EE_Credit.
Beginning Running Disparity	The disparity at the transmitter or receiver when the special character associated with an ordered set is encoded or decoded. See also *Disparity.*
BER	Bit Error Rate. Rate at which bits are expected to be received in error. Expressed as ratio of error bits to total bits transmitted. See also Error.
Bit synch-ronization	The delivery of correctly clocked bits at the required BER. See also BER.
Block	As applied to fibre channel, upper level application data that is transferred in a single sequence.
Broadcast	Transmission of data from a single source to all devices in fabric, regardless of zoning. See also Multicast, Unicast.
Buffer-to-buffer flow control	Management of frame transmission rate between directly connected ports or within an arbitrated loop. See also BB_Credit.
Cascade	Two or more interconnected fibre channel switches.
Circuit	Established communication path between ports. Consists of two virtual circuits that transmit in opposite directions. See also Link.
Class 1	A connection-oriented service that provides a dedicated connection between two ports, with notification of delivery or nondelivery.
Class 2	A multiplex and connectionless frame switching service between two ports, with notification of delivery or nondelivery.

Class 3	A connectionless frame switching service between two ports, without notification of delivery or nondelivery. Can also be used to provide a multicast connection between originator and recipients, with notification of delivery or nondelivery.
Class 4	Connection-oriented service that provides a virtual circuit between two ports, including notification of delivery or non-delivery. Allows fractional parts of the bandwidth to be used in a virtual circuit.
Class 6	Connection-oriented service that provides a multicast connection between the multicast originator and recipients, including notification of delivery or non-delivery.
Class F	A connectionless service for control traffic between switches, with notification of delivery or nondelivery between the E_Ports.
Class of service	A set of specific delivery characteristics and attributes for frame delivery.
CLS	Close Primitive Signal. The protocol used by a port in an arbitrated loop to close a circuit.
Code Balance	The ratio of one bit to the total number of transmitted bits.
Comma	Unique pattern (either 1100000 or 0011111) used in 8b/10b encoding to specify character alignment within a data stream. See also K28.5.
Community (SNMP)	Relationship between a group of SNMP managers and an SNMP agent, in which authentication, access control, and proxy characteristics are defined.
Connection Initiator	A port that has originated a Class 1 dedicated connection and received a response from the recipient.
Connection Recipient	A port that has received a Class 1 dedicated connection request and transmitted a response to the originator.
CRC	Cyclic Redundancy Check. A check for transmission errors; included in every data frame.
Credit	As applies to fibre channel, the number of receive buffers available for transmission of frames between ports. See also BB_Credit and EE_Credit.
CT_HDR	Common transport header. A header that conforms to the Fibre Channel Common Transport (FC_CT) protocol.

CT_IU	Common transport information unit. An information unit that conforms to the Fibre Channel Common Transport (FC_CT) protocol.
Current Fill Word	The fill word currently selected by the LPSM (loop port state machine). See also Fill Word.
Cut-through	Switching technique that allows selection of a transmission route for a frame as soon as destination address is received. See also Route.
Data word	Type of transmission word that occurs within frames. The frame header, data field, and CRC consist of data words. See also Frame, Ordered set, Transmission word.
Defined configuration	The complete set of all zone objects defined in the fabric; can include multiple zone configurations. See also Enabled configuration, Zone configuration.
Disparity	The relationship of ones and zeros in an encoded character. Neutral disparity indicates an equal number of each, positive disparity a majority of ones, and negative disparity a majority of zeros.
Distributed Fabrics	The combined user's guides for Extended Fabrics and Remote Switch. Not a software product.
DLS	Dynamic Load Sharing. Dynamic distribution of traffic over available paths. Allows for redistribution when an Fx_Port or E_Port comes up or down.
Domain ID	Unique identifier for the switch in a fabric. Usually automatically assigned by the switch, but can also be assigned manually. Can be any value between 1 and 239.
E_D_TOV	Error Detect Time-out Value. Time allowed for round-trip transmission before recovery is initiated. Can also be defined as the minimum time an L_Port waits for sequence completion before initiating recovery. See also R_A_TOV.
E_Port	Expansion Port. A switch port that has the ability to connect to a similar port on another switch, allowing creation of an interswitch link. See also ISL.
EE_Credit	End-to-end credit. The number of receive buffers allocated by recipient port to originating port. Used by Class 1 and 2 services to manage exchange of frames across intervening ports in fabric. See also End-to-end flow control, BB_Credit.

Enabled configuration	The currently enabled zone configuration. Only one configuration can be enabled at a time. See also Defined configuration, Zone configuration.
End-to-end flow control	Governs flow of Class 1 and 2 frames between N_Ports. See also Buffer-to-buffer flow control, EE_Credit.
Error	As applies to fibre channel, a missing or corrupted frame, time-out, loss of synchronization, or loss of signal. See also Loop failure.
Exchange	As applies to fibre channel, a communication session between N_Ports involving the transmission of one or more related sequences, in one or both directions. See also Sequence.
Extended Fabrics	Software product that allows interconnection of fibre channel fabric over distances of up to 100 kilometers.
F_Port	Fabric Port. A port that can transmit using fabric protocol and can interface over links. Can be used to connect N_Ports to a switch. See also FL_Port, Fx_Port.
Fabric	A fibre channel network of two or more switches. Also called a “switched fabric.” See also SAN, Cascade.
Fabric name	Unique 64-bit identifier assigned to each separate fabric. Communicated during login and port discovery.
Fabric OS	Operating system.
Fabric Watch	Software product that allows monitoring and configuration of fabric and switch elements.
FC-AL-3	The Fibre Channel Arbitrated Loop standard. Defined on top of FC-PH standards.
FC-FLA	The Fibre Channel Fabric Loop Attach standard.
FCP	Fibre Channel Protocol. Mapping of protocols onto fibre channel standard protocols. For example, SCSI FCP maps SCSI-3 onto fibre channel.
FC-PH-1, 2, 3	The Fibre Channel Physical and Signaling Interface standards.
FC-PI	The Fibre Channel Physical Interface standard.

FC-PLDA	The Fibre Channel Private Loop Direct Attach standard. Applies to operation of peripheral devices on private loops.
FC-SW-2	The Fibre Channel Switch Fabric standard, second generation. Specifies tools and algorithms for interconnection and initialization of fibre channel switches.
Fibre channel transport	Protocol service that supports communication between fibre channel service providers. See also FSP.
FIFO	First In, First Out. May refer to a data buffer that follows the first in, first out rule.
Fill word	A word transmitted to keep a fibre active. Either an idle or ARB ordered set.
FL_Port	Fabric Loop Port. A port that can transmit under both fabric protocol and loop protocol. Can be used to connect NL_Ports to a switch. See also F_Port, Fx_Port.
FLOGI	Fabric Login. Process by which a node makes a logical connection to fabric. Used by ports to determine if fabric is present, and if so to exchange service parameters with the fabric. See also PLOGI.
Frame	Fibre channel structure used to transmit data. Consists of start-of-frame delimiter, header, any optional headers, data payload, cyclic redundancy check (CRC), and end-of-frame delimiter. There are two types: data frames and link control frames. Similar to the networking concept "packet." See also Sequence, Data word.
FRU	Field Replaceable Unit. A component that can be replaced on site.
FS	Fibre Channel Service. A service that is defined by fibre channel standards and exists at a well-known address. For example, Name Server is a fibre channel service. See also FSP.
FS_ACC	Fibre channel services accept. The information unit used to indicate acceptance of a request for a fibre channel service.
FS_IU	Fibre channel services information unit. An information unit that has been defined by a specific fibre channel service.
FS_REQ	Fibre channel services request. A request for a fibre channel services function, or notification of a fabric condition or event.

FS_RJT	Fibre channel services reject. An indication that a request for fibre channel services could not be processed.
FSP	Fibre Channel Service Protocol. The common protocol used for all fabric services, transparent to fabric type or topology. See also FS.
FSPF	Fabric Shortest Path First. Routing protocol for fibre channel switches.
Full-duplex	Mode of communication that allows a port to simultaneously transmit and receive frames. See also Half-duplex.
Fx_Port	Fabric port that can operate either as F_Port or FL_Port. See also F_Port, FL_Port.
G_Port	Generic Port. Port that can operate either as E_Port or F_Port. Ports are defined as G_Ports when disconnected or have not assumed specific function within fabric.
Gateway	IP address assignment that provides translation for incompatible networks. For example, ATM gateway can connect a fibre channel link to an ATM connection.
GBIC	Gigabit Interface Converter. Removable serial transceiver module that allows gigabit physical-layer transport for fibre channel.
Gbps	Gigabits (1,062,500,000 bits) per second.
GBps	Gigabytes (1,062,500,000 bytes) per second.
Half-duplex	Mode of communication that allows a port to either transmit or receive frames, but not both at simultaneously. The only exception is link control frames, which can be transmitted at any time. See also Full-duplex.
Hard address	The AL_PA that an NL_Port attempts to acquire during loop initialization.
Hardware Translative Mode	A method for achieving address translation. The following two hardware translative modes are available to a QuickLoop enabled switch: • Standard Translative Mode: Allows public devices to communicate with private devices that are directly connected to the fabric. • QuickLoop Mode: Allows initiator devices to communicate with private or public devices that are not in the same loop.

HBA Host Bus Adapter. Interface card between a server or workstation bus and the fibre channel network. Similar to a network interface card.

Hub Fibre channel wiring concentrator that collapses loop topology into physical star topology. Nodes are automatically added when active and removed when inactive.

Idle Continuous transmission of an ordered set when no data is being transmitted to maintain an active fibre channel link and bit, byte, and word synchronization. See also Fill word.

IN_ID Initial identifier. The field in the CT_HDR where the port ID of the client originator of a Fibre Channel Services request.

Initiator Server or workstation that initiates communications with storage devices over a fibre channel network. See also Target.

IOD In Order Delivery. A parameter that, when set, guarantees that frames are delivered in order if possible, otherwise frames are dropped.

IPA Initial process associator. An identifier associated with a process at an N_Port.

ISL Interswitch Link. Fibre channel link from the E_Port of one switch to the E_Port of another. See also *E_Port*, *Cascade*.

Isolated E_Port A port that is online but not operational between switches due to overlapping domain ID or nonidentical parameters such as E_D_TOVs.

IU Information Unit. An individual set of information as defined by higher-level process protocol definition, or upper-level protocol mapping.

JBOD Just a Bunch Of Disks. A number of disks connected in a single chassis to one or more controllers. See also RAID.

K28.5 Special 10-bit character used to indicate beginning of transmission words that perform fibre channel control and signaling functions. First seven bits are comma pattern. See also Comma.

L_Port Loop Port. Node or fabric port that can use loop protocol or fabric protocol. See also Nonparticipating mode, Participating mode.

Latency Time required to transmit a frame, from the time sent until time of arrival.

Link	As applies to fibre channel, a physical connection between two ports, consisting of both transmit and receive fibres. See also Circuit.
Link services	Protocol for link-related actions.
LIP	Loop Initialization Primitive. The signal used to begin initialization in a loop. Indicates either loop failure or resetting of a node. See also Loop initialization.
LIS_HOLD_TIME	The maximum period of time for a node to forward a loop initialization sequence.
LM_TOV	Loop Master Timeout Value. The minimum time that the loop master waits for a loop initialization sequence to return.
Login BB_Credit	The number of receive buffers a receiving L_Port has available when a circuit is first established. Communicated through PLOGI, PDISC link service, or FLOGI.
Loop Circuit	A temporary bidirectional communication path established between L_Ports.
Loop failure	Loss of signal within a loop for any period of time, or loss of synchronization for longer than the time-out value. See also E_D_TOV.
Loop initialization	Logical procedure used by L_Ports to discover environment. Can be used to assign AL_PA addresses, detect loop failure, or reset a node. See also LIP.
Loop_ID	Hex value representing one of 127 possible AL_PA values in a loop.
Looplet	Set of devices connected in a loop to a port that is part of another loop.
LPSM	Loop Port State Machine. Logical entity that performs arbitrated loop protocols and defines behavior of L_Ports when they require access to arbitrated loop.
LWL	Long wavelength fibre optic cable. Based on 1300-nm lasers supporting 1.0625- Gbps link speeds. Connectors are color-coded blue. See also SWL.
MIB	Management Information Base. SNMP structure that provides configuration and device information to assist with device management.
Monitoring State	The state in which a port is monitoring the flow of information for data relevant to the port.

Multicast	Transmission of data from a single source to a number of specified N_Ports. See also Broadcast, Unicast.
Multimode	Fibre-optic cabling specification allowing up to 500 meters between devices.
N_Port	Node Port. Port that can attach to a fibre channel port. See also NL_Port, Nx_Port.
NAA	Network address authority. An identifier that indicates the format of a network address.
Name server	Service of storing names, addresses, and attributes for up to 15 minutes, provided by a switch to other entities in fabric. Defined by fibre channel standards, and existing at a well-known address. Also called Simple Name Server, SNS, or directory service. See also FS.
NL_Port	Node Loop Port. An N_Port that can use loop protocol. Used to connect equipment ports to fabric in loop configuration through FL_Port. See also N_Port, Nx_Port.
Node	Fibre channel entity with one or more N_Ports or NL_Ports.
Node name	Unique identifier for a node, communicated during login and port discovery.
Nonparticipating mode	Mode in which L_Port is inactive in loop and cannot arbitrate or send frames, but can retransmit received transmissions. Port enters mode if there are more than 127 devices in loop, and an AL_PA cannot be acquired. See also Participating mode.
Nx_Port	Node port that can operate as either an N_Port or NL_Port.
Open Originator	The L_Port that wins arbitration in an arbitrated loop and sends an OPN ordered set to the destination port, then enters the Open state.
Open Recipient	The L_Port that receives the OPN ordered set from the open originator, and then enters the Open state.
Open State	The state in which a port can establish a circuit with another port. A port must be in the Open state before it can arbitrate.
OPN	Open Primitive Signal. The protocol use by a port that has won arbitration in an arbitrated loop to establish a circuit.

Ordered set	A type of transmission word that occurs outside of frames, and is used to manage frame transport and differentiate fibre channel control information from data. See also Data word, Transmission word. Use 8b/10b mapping and begin with the K28.5 character. They include frame delimiters (which mark frame boundaries and describe frame contents), primitive signals (indicate events), and primitive sequences (indicate or initiate port states).
Participating mode	Mode in which an L_Port in a loop has valid AL_PA and can arbitrate, send frames, and retransmit received transmissions. See also Nonparticipating mode.
Path Selection	The selection of a transmission path through the fabric.
Phantom device	Device not physically in a loop but logically included by phantom address.
Phantom address	AL_PA value assigned to device not physically in loop. Also called phantom AL_PA.
PLOGI	Port Login. Port-to-port login process by which initiators establish sessions with targets. See also FLOGI.
Point-to-point	Two fibre channel devices connected by a direct link. See also Topology.
Port_Name	Unique FC identifier for port, communicated during login and port discovery.
POST	Power On Self Test. Series of self-tests run after a switch is rebooted or reset.
Private NL_Port	NL_Port that does not log into the fabric and communicates only with private NL_Ports in same loop.
Private device	Device that supports arbitrated loop protocol and understands 8-bit addresses, but cannot log into fabric.
Private loop	An arbitrated loop with no fibre channel attachment.
Protocol	A defined method and standards for communication.
Public NL_Port	NL_Port that logs into the fabric, can function within public or private loops, and can communicate with public or private NL_Ports.
Public device	Device that supports arbitrated loop protocol, understands 8-bit addresses, and can log into fabric.
Public loop	An arbitrated loop attached to a switch.

QuickLoop	Can indicate either the software product that allows private devices within loops to communicate over the fabric with other devices, or the set of actual devices or looplets connected in a loop by the QuickLoop technology. All devices in a QuickLoop share a single AL_PA space and behave as if they are in one loop.
R_A_TOV	Resource Allocation Time-out Value. Maximum time a frame can be delayed in the fabric and still be delivered. See also E_D_TOV.
RAID	Redundant Array of Independent Disks. Collection of disk drives that appear as a single volume to the server, and are fault-tolerant through mirroring or parity checking. See also JBOD.
Remote Switch	A switch that is not directly attached to the originating switch. The connection may contain intervening switches.
Request Rate	The rate at which requests arrive at a servicing entity. See also *Service Rate*.
Remote Switch	Software product that enables two switches to connect over an ATM connection. Requires compatible fibre channel-to-ATM gateways. Can be up to 10 kilometers distance between each switch and respective gateway.
Route	As applies to fabric, a communication path between two switches.Routing is the assignment of Class 2 or 3 frames to the most appropriate switch ports for the intended destinations. See also FSPF.
RR_TOV	Resource Recovery Timeout Value. The minimum time a target device in a private loop must wait after a LIP before logging out a SCSI initiator. See also *E_D_TOV*, *R_A_TOV*.
RSCN	Registered State Change Notification. Switch function that sends notification of fabric changes from the switch to specified nodes.
SAN	Storage Area Network. Network of systems and storage devices that usually communicate using fibre channel protocols. See also Fabric.
Sequence	A fibre channel structure containing one or more frames transmitted in a unidirectional manner between N_Ports. See also Exchange, Frame.
Service Rate	The rate at which an entity can service requests. See also *Request Rate*.
SI	Sequence Initiative.

Single mode	Fibre-optic cabling standard that provides for distances of up to 10 kilometers between devices.
SNMP	Simple Network Management Protocol. Internet management protocol that does not rely on underlying communication protocols and can therefore be made available over other protocols, such as UDP/IP. Uses IP for network layer functions and UDP for transport layer functions, or TCP/IP for both. See also Community (SNMP).
SNMPv1	The original standard for SNMP, now labeled v1.
SNS	Simple Name Server. See Name server.
Switch	A combination of hardware and firmware that routes frames according to fibre channel protocol. Switches can have G_Ports, E_Ports, F_Ports, and FL_Ports.
Switch Domain_ID	Unique identifier for a switch, used in routing frames. Usually automatically assigned by the switch, but can be manually assigned by administrator.
Switch name	Arbitrary name assigned to switch by administrator. See also Switch Domain_ID.
Switch Port	Port on a switch. Switch ports can be E_Ports, F_Ports, or FL_Ports.
SWL	Short wavelength fiber-optic cable. Based on 850-nm lasers supporting 1.0625-Gbps link speeds. Connectors are color-coded black. See also LWL.
Target	Storage device that receives communications from a server or workstation over a fibre channel network. See also Initiator.
Tenancy	The time from when a port wins arbitration in a loop until the same port returns to the monitoring state. Also referred to as loop tenancy.
Throughput	The rate of data flow achieved within a cable, link, or system. See also *Bandwidth*.
Topology	As applies to fibre channel, the structure of the fibre channel network and the resulting possible communication paths. There are three fibre channel topologies: point-to-point, fabric, and arbitrated loop.
Transfer State	A state in which a port can establish circuits with multiple ports without reentering the arbitration cycle for each circuit. This state can only be accessed by an L_Port in the Open state.

Translative mode	Mode in which public devices can communicate with private devices across fabric.Translates 8-bit to 24-bit addresses.
Transmission Character	A 10-bit character encoded according to the rules of the 8b/10b algorithm. See also 8b/10b encoding, Transmission word.
Transmission Word	Group of four transmission characters, totaling 40 bits. Two types: data words and ordered sets. See also Data word, Ordered set, Transmission character.
Trap (SNMP)	Message sent by SNMP agent to inform SNMP management station of critical error. See also SNMP.
Tunneling	Technique for enabling source and destination hosts to communicate when on same type of network, but connected by a different type of network.
U_Port	Universal Port. Switch port that can operate as G_Port, E_Port, F_Port, or FL_Port. A port is defined as a U_Port if not connected, or if it has not assumed a specific function in the fabric.
UDP	User Datagram Protocol. A protocol that runs on top of IP and provides port multiplexing for higher layer protocols.
ULP	Upper Layer Protocol. Protocol that runs on top of fibre channel. Typical upper layer protocols: SCSI, IP, HIPPI, IPI.
ULP_TOV	Upper Level Timeout Value.The minimum time that a SCSI ULP process waits for SCSI status before initiating ULP recovery.
Unicast	Transmission of data from a single source to single destination. See also Broadcast, Multicast.
Web Tools	Software product that provides a graphical interface for monitoring and managing individual switches or entire fabrics from standard workstations.
Well-known address	As applies to fibre channel, a logical address stored on the switch and defined by fibre channel standards as being assigned to a specific function.
WWN	Worldwide name. Identifier that is unique world-wide. Each entity in a fabric has a separate WWN.
Xmitted Close State	The state in which an L_Port cannot send messages, but can retransmit messages within the loop. A port in the XMITTED CLOSE state cannot attempt to arbitrate.

Zone	Set of hosts and devices attached to same fabric and having access permission, including RSCNs and user data, to each other. Entities inside a zone are not visible to entities outside the same zone, even if the outside entities are in another zone. Equivalent to network term “virtual LAN”.
Zone configuration	A specified set of zones. Enabling a zone configuration enables all zones in that configuration. See also Defined configuration, Enabled configuration.
Zoning	Software product that allows partitioning of fabric into logical groupings of devices. See also Zone.

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